

NASA SP-7011 (363)

June 1992

P. 69

AEROSPACE MEDICINE AND BIOLOGY

A CONTINUING BIBLIOGRAPHY WITH INDEXES



(NASA-SP-7011(363)) AEROSPACE
MEDICINE AND BIOLOGY: A CONTINUING
BIBLIOGRAPHY WITH INDEXES
(SUPPLEMENT 363) (NASA) 69 p

N92-30987

Unclass

00/52 0099083

NASA SP-7011 (363)

June 1992

AEROSPACE MEDICINE AND BIOLOGY

A CONTINUING BIBLIOGRAPHY WITH INDEXES



National Aeronautics and Space Administration
Scientific and Technical Information Program
Washington, DC

1992

INTRODUCTION

This issue of *Aerospace Medicine and Biology* (NASA SP-7011) lists 179 reports, articles and other documents originally announced in May 1992 in *Scientific and Technical Aerospace Reports (STAR)* or in *International Aerospace Abstracts (IAA)*. The first issue of *Aerospace Medicine and Biology* was published in July 1964.

Accession numbers cited in this issue are:

STAR (N-10000 Series)	N92-18006 — N92-20045
IAA (A-10000 Series)	A92-24399 — A92-28554

In its subject coverage, *Aerospace Medicine and Biology* concentrates on the biological, physiological, psychological, and environmental effects to which humans are subjected during and following simulated or actual flight in the Earth's atmosphere or in interplanetary space. References describing similar effects on biological organisms of lower order are also included. Such related topics as sanitary problems, pharmacology, toxicology, safety and survival, life support systems, exobiology, and personnel factors receive appropriate attention. Applied research receives the most emphasis, but references to fundamental studies and theoretical principles related to experimental development also qualify for inclusion.

Each entry in the publication consists of a standard bibliographic citation accompanied in most cases by an abstract. The listing of the entries is arranged by *STAR* categories 51 through 55, the Life Sciences division. The citations include the original accession numbers from the respective announcement journals.

Seven indexes—subject, personal author, corporate source, foreign technology, contract, report number, and accession number—are included.

A cumulative index for 1992 will be published in early 1993.

Information on availability of documents listed, addresses of organizations, and NTIS price schedules are located at the back of this issue.

TABLE OF CONTENTS

	Page
Category 51 Life Sciences (General)	155
Category 52 Aerospace Medicine	161
Includes physiological factors; biological effects of radiation; and effects of weightlessness on man and animals.	
Category 53 Behavioral Sciences	175
Includes psychological factors; individual and group behavior; crew training and evaluation; and psychiatric research.	
Category 54 Man/System Technology and Life Support	177
Includes human engineering; biotechnology; and space suits and protective clothing.	
Category 55 Space Biology	N.A.
Includes exobiology; planetary biology; and extraterrestrial life.	
Subject Index	A-1
Personal Author Index	B-1
Corporate Source Index	C-1
Foreign Technology Index	D-1
Contract Number Index	E-1
Report Number Index	F-1
Accession Number Index	G-1
Appendix	APP-1

TYPICAL REPORT CITATION AND ABSTRACT

NASA SPONSORED
ON MICROFICHE

ACCESSION NUMBER → **N92-11637*** # Vanderbilt Univ., Nashville, TN. Dept. of Electrical Engineering. ← CORPORATE SOURCE

TITLE → **ROBOT GRAPHIC SIMULATION TESTBED Final Report**

AUTHORS → **GEORGE E. COOK, JANOS SZTIPANOVITS, CSABA BIEGL, GABOR KARSAL, and JAMES F. SPRINGFIELD** Aug. 1991 ← PUBLICATION DATE

CONTRACT NUMBER → (Contract NAG8-690)

REPORT NUMBERS → (NASA-CR-188998; NAS 1.26:188998) Avail: NTIS HC/MF A06; ← AVAILABILITY SOURCE

PRICE CODE
COSATI CODE

12 functional color pages CSCL 06/11

The objective of this research was twofold. First, the basic capabilities of ROBOSIM (graphical simulation system) were improved and extended by taking advantage of advanced graphic workstation technology and artificial intelligence programming techniques. Second, the scope of the graphic simulation testbed was extended to include general problems of Space Station automation. Hardware support for 3-D graphics and high processing performance make high resolution solid modeling, collision detection, and simulation of structural dynamics computationally feasible. The Space Station is a complex system with many interacting subsystems. Design and testing of automation concepts demand modeling of the affected processes, their interactions, and that of the proposed control systems. The automation testbed was designed to facilitate studies in Space Station automation concepts.

Author

TYPICAL JOURNAL ARTICLE CITATION AND ABSTRACT

ACCESSION NUMBER → **A92-10353**

TITLE → **EFFECTS OF HYPOXIA AND COLD ACCLIMATION ON THERMOREGULATION IN THE RAT**

AUTHORS → **H. GAUTIER, M. BONORA, S. B. M'BAREK, and J. D. SINCLAIR** (Paris VI, Universite, France; Auckland, University, New Zealand) ← AUTHORS' AFFILIATION

JOURNAL TITLE → **Journal of Applied Physiology** (ISSN 0161-7567), vol. 71, Oct. 1991, p. 1355-1363. Research supported by Institut National de la Sante et de la Recherche Medicale. refs ← PUBLICATION DATE

Copyright

Results are reported from an experimental study tracing the effects of hypoxia on thermoregulation and on the different sources of thermogenesis in rats before and after periods of 1-4 wk of cold acclimation. Measurements of the metabolic rate (VO₂) and body temperature (T_b) were made at 5-min intervals, and shivering activity was recorded continuously in groups of rats subjected to three protocols. Recordings were made in normoxia and in hypoxia on different days in the same animals. The results show that: (1) in noncold-acclimated (NCA) rats, cold exposure induced increases in VO₂ and shivering that were proportional to the decrease in T_a; (2) in cold-acclimated (CA) rats in normoxia, for a given ambient temperature, VO₂ and T_b were higher than in NCA rats, whereas shivering was generally lower; and (3) in both NCA and CA rats, hypoxia induced a transient decrease in shivering and a sustained decrease in nonshivering thermogenesis associated with a marked decrease in T_b that was about the same in NCA and CA rats. It is concluded that hypoxia acts on T_b control to produce a general inhibition of thermogenesis.

P.D.

AEROSPACE MEDICINE AND BIOLOGY

A Continuing Bibliography (Suppl. 363)

June 1992

51

LIFE SCIENCES (GENERAL)

A92-25259

THE EFFECT OF VARIOUS TYPES OF ABNORMALITIES OF THE CUPULOENDOLYMPHATIC SYSTEM OF THE VESTIBULAR APPARATUS ON THE SYSTEM'S DYNAMIC CHARACTERISTICS [VLIANIE RAZLICHNYKH VIDOV PATOLOGII KUPULO-ENDOLIMFATICHESKOI SISTEMY VESTIBULIARNOGO APPARATA NA EE DINAMICHESKIE KHARAKTERISTIKI]

V. M. GUSEV and I. V. ORLOV Kosmicheskaya Biologiya i Aviakosmicheskaya Meditsina (ISSN 0321-5044), vol. 25, Sept.-Oct. 1991, p. 17-20. In Russian. refs
Copyright

Results are presented of calculations designed to show the mechanism of the effect of abnormalities in the semicircular canal on the biophysical characteristics of the vestibular apparatus expressed as shifts of endolymph in the area of the cupular partition. It is shown that various types of abnormalities (such as an obstruction in the canal or the separation of cupula from the wall of the ampulla) lead to different types of distortions of the informational properties of the canal. I.S.

A92-25261

THE EFFECT OF WEIGHTLESSNESS ON THE PROGRESS OF MUSCLE REPAIR IN RATS FLOWN ON THE COSMOS-2044 BIOSATELLITE [VLIANIE NEVESOMOSTI NA TECHENIE REPARATIVNOGO PROTSESSA V MYSHTSAKH KRYA, EKSPONIROVANNYKH NA BIOSPUTNIKE 'KOSMOS-2044']

E. I. IL'INA-KAKUEVA and T. E. BURKOVSKAYA Kosmicheskaya Biologiya i Aviakosmicheskaya Meditsina (ISSN 0321-5044), vol. 25, Sept.-Oct. 1991, p. 24-29. In Russian. refs
Copyright

The effect of microgravity on the rate of repair of damaged skeletal musculature was investigated in rats flown for 14 days aboard Cosmos-2044, two days after their soleus and gastrocnemius muscles were crushed by clamp forceps. A comparison of microscopic examinations of flown and ground-control rats showed that the exposure to space flight inhibited the repair process but did not impair its phasic development. As a result, the reparative field was smaller, the myofibers that originated from the ends of injured atrophic fibers were thinner, and some fibers underwent splitting. It is postulated that the muscle-repair inhibition was due to the same mechanism that produces muscle atrophy under microgravity. I.S.

A92-25262

THE EFFECT OF WEIGHTLESSNESS ON HEALING OF BONE FRACTURES IN RATS FLOWN ON THE COSMOS-2044 BIOSATELLITE [VLIANIE NEVESOMOSTI NA ZAZHIVLENIE PERELOMOV KOSTEI U KRYA, EKSPONIROVANNYKH NA BIOSPUTNIKE 'KOSMOS-2044']

G. N. DURNOVA, T. E. BURKOVSKAYA, E. V. VOROTNIKOVA, A. S. KAPLANSKII, and O. V. ARUSTAMOV Kosmicheskaya Biologiya

i Aviakosmicheskaya Meditsina (ISSN 0321-5044), vol. 25, Sept.-Oct. 1991, p. 29-33. In Russian. refs
Copyright

The effect of microgravity on the healing characteristics of bone tissue was investigated in rats flown aboard Cosmos-2044, two days after the animals underwent an operation in which their fibulae were cut bilaterally. Results of histological and histomorphometrical examinations showed that healing was inhibited; bone callus was underdeveloped and the bone fragment consolidation was inadequate. The newly formed bone tissue exhibited increases in the relative volume of osteoid and a decrease in the number and activity of osteoblasts, signs of mineral disorders. Similar results were observed in rats exposed to tail suspension. I.S.

A92-25265

SOME INDICES OF PROTEIN AND NUCLEIC ACID METABOLISM IN THE LYMPHOID ORGANS OF RATS SUBJECTED TO HYPOKINESIA AND TO VITAMIN-B1 DEFICIENCY [NEKOTORYE POKAZATELI METABOLIZMA BELKOV I NUKLEINOVYKH KISLOT V LIMFOIDNYKH ORGANAKH KRYA V USLOVIYAKH GIPOKINEZII I DEFITSITA VITAMINA B1]

L. N. DVORIANINOVICH and V. V. KLIMOVICH Kosmicheskaya Biologiya i Aviakosmicheskaya Meditsina (ISSN 0321-5044), vol. 25, Sept.-Oct. 1991, p. 41-43. In Russian. refs
Copyright

The effects of long-term hypokinesia and vitamin B1 deficiency on the amounts of total protein, nucleic acids, alanine aminotransferase, aspartate aminotransferase, and methionine- and cysteine-tRNA synthetases in the thymus and spleen of rats were investigated in animals kept for 15 days in restraining cages. The results suggested that the hypokinesia-induced disorders in protein and nucleic acid metabolisms observed in the two organs are aggravated when rats are made deficient in vitamin B1 by feeding oxythiamine. I.S.

A92-25267

FUNCTIONAL STATE OF THE CNS AT AN EARLY PERIOD OF THE DEVELOPMENT OF RADIATION SICKNESS AFTER IRRADIATION WITH HELIUM IONS [FUNKTSIONAL'NOE SOSTOYANIE TSNS V RANNII PERIOD FORMIROVANIYA I RAZVITIYA LUCHEVOGO PORAZHENIYA POSLE OBLUCHENIYA IONAMI GELIYA]

N. I. SAVCHENKO Kosmicheskaya Biologiya i Aviakosmicheskaya Meditsina (ISSN 0321-5044), vol. 25, Sept.-Oct. 1991, p. 46-48. In Russian. refs
Copyright

The effect of whole-body irradiation by various doses of accelerated helium ions on the functional activity of the central nervous system (CNS) of rats was investigated by monitoring the behavioral reactions of the animals at different times after irradiation. Results showed that the changes that developed in the CNS after irradiation with He ions were similar to those that develop during early stages of radiation sickness. I.S.

A92-25268

THE EFFECTS OF ISOLATED AND COMBINED EXPOSURES TO A CONSTANT MAGNETIC FIELD AND ANTIORTHOSTATIC HYPOKINESIA ON THE CENTRAL HEMODYNAMICS IN RATS [VLIIANIE IZOLIROVANNOGO I KOMBINIROVANNOGO DEISTVIA POSTOIANNOGO MAGNITNOGO POLIA I ANTIORTOSTATICHESKOI GIPOKINEZII NA TSENTRAL'NUIU GEMODINAMIKU U KRYS]

R. T. KAZAKOVA and A. M. BADAQVA Kosmicheskaya Biologiya i Aviakosmicheskaya Meditsina (ISSN 0321-5044), vol. 25, Sept.-Oct. 1991, p. 48, 49. In Russian. refs
Copyright

The effect of exposures to a constant magnetic field (CMF) combined with hypokinesia on the parameters of the central hemodynamics system was investigated in rats subjected to tail suspension for periods of 3 hr, 1 day, and 7 days and/or to 3-hr-long exposures to a CMF of 0.4 T intensity. It was found that 3-h-long exposures to magnetic field did not significantly affect central blood circulation in control rats, which were moving freely. However, the exposures to magnetic field during hypokinesia were found to alleviate the effects of hypokinesia. I.S.

A92-25270

THE EFFECT OF A PULSED ELECTROMAGNETIC FIELD ON THE ACCUMULATION OF CALCIUM IONS BY THE SARCOPLASMIC RETICULUM OF RAT HEART MUSCLE [DEISTVIE IMPUL'SNOGO ELEKTROMAGNITNOGO POLIA NA AKKUMULIATSIIU IONOV KAL'TSIIA SARKOPLAZMATICHESKIM RETIKULUMOM SERDECHNOI MYSHTSY KRYSY]

V. A. LOGINOV, N. V. GORBATENKOVA, and V. I. A. KLIMOVITSKII Kosmicheskaya Biologiya i Aviakosmicheskaya Meditsina (ISSN 0321-5044), vol. 25, Sept.-Oct. 1991, p. 51-53. In Russian. refs
Copyright

The effect of a single electromagnetic pulse on the amount of calcium ions accumulated by the sarcoplasmic reticulum of rat heart muscle was investigated using an ion-selective electrode for measuring the rate of Ca^{2+} accumulation by rat-heart homogenates subjected to monopolar electromagnetic pulses of 1 ms duration, 10-Hz frequency, and from 1 to 10 mT magnetic induction. It was found that 100-min-long exposures led to 70 percent inhibition of Ca^{2+} transfer across the sarcoplasmic reticulum. The effect is associated with direct inhibition of Ca^{2+} -ATPase. I.S.

A92-25271

INVESTIGATION OF THE CYCLIC KINETICS OF IMMUNITY BY MATHEMATICAL MODELING METHODS [ISSLEDOVANIIE TSIKLICHESKOI KINETIKI IMMUNITETA METODAMI MATEMATICHESKOGO MODELIROVANIYA]

O. A. SMIRNOVA Kosmicheskaya Biologiya i Aviakosmicheskaya Meditsina (ISSN 0321-5044), vol. 25, Sept.-Oct. 1991, p. 53-56. In Russian. refs
Copyright

A mathematical model of the humoral immune response to soluble antigens was developed and used to investigate the mechanisms involved in the dynamics of the immune response. It is shown that, at the zero rate of removal, the concentration of free antigen is a hyperbolic function of the sum of antibody concentrations. This relationship explains variations in the immune reaction, based on the dynamics of antibody accumulation: as the antibody concentration increases, the concentration of free antigen decreases, leading to a decrease in stimulated immunocompetent cells and in antibody synthesis. I.S.

A92-25275

PROPHYLACTIC AND SENSITIZING EFFECTS OF BIOLOGICALLY ACTIVE SUBSTANCES IN THE SIMULATION OF VESTIBULOVEGETATIVE DISORDERS [PROFILAKTICHESKOE I SENSIBILIZIRUIUSHCHEE DEISTVIE BIOLOGICHESKI AKTIVNYKH VESHCHESTV PRI MODELIROVANII VESTIBULOVEGETATIVNYKH RASSTROISTV]

V. S. SHASHKOV, I. V. DROZD, and V. M. PUKO Kosmicheskaya Biologiya i Aviakosmicheskaya Meditsina (ISSN 0321-5044), vol. 25, Sept.-Oct. 1991, p. 61-63. In Russian. refs
Copyright

Mechanisms involved in the development of vestibulovegetative disorders (VVDs) in cats were investigated by analyzing the effects of various biologically active substances on the development of the motion-sickness syndrome in cats exposed to vestibulovegetative stimuli. It was found that inhibitors of the opioid receptors, such as naloxone and ICI 154129, when injected into the cerebral ventricle, delay the onset of motion sickness, while the inhibitors of other receptors of the chemoreceptor trigger zone, such as pipolfen, scopolamine, haloperidol, and deseril, are not effective. Alpha-endorphin, enkephalins, and AKTG(1-39) showed sensitizing activity. The common property of all protecting polypeptides was the presence of glutamic acid in their amino-acid sequences, while the N-terminals of all sensitizers contained tyrosine. It was also found that vitamin E had a protective effect. I.S.

A92-25276

PROTECTION FROM EFFECTS OF RADIATION AT SUBLETHAL DOSES DURING EXPOSURES TO HYPERGRAVITATION [POPYTKA PROTIVOLUCHEVOI ZASHCHITY PRI SUBLETAL'NOM OBLUCHENII V USLOVIAKH GIPERGRAVITATSII]

M. I. MINKOVA and T. P. PANTEV Kosmicheskaya Biologiya i Aviakosmicheskaya Meditsina (ISSN 0321-5044), vol. 25, Sept.-Oct. 1991, p. 63, 64. In Russian. refs
Copyright

The effects of hypergravitation (G) and of two radiation protective substances, eleutherococcus (E) and adeturon (A), on the development and progress of radiation sickness in rats were investigated in animals exposed to centrifugal acceleration to +5 Gx and/or irradiation (I) by Cs-137 (3 Gy), delivered in the following combinations: E + I, E + G + I, and E + G + A + I. Results indicate that acceleration delivered 1 h before irradiation did not change the sensitivity of animals to radiation sickness development, but canceled the beneficial effect of E, while injections of A in the combination E + G + A + I did not alleviate the early symptoms of radiative sickness, but increased the speed of recovery. I.S.

A92-25402

PILEATE MUSHROOMS AND ALGAE - OBJECTS FOR SPACE BIOLOGY [SHLIAPOCHNYE GRIBY I VODOROSLI: OB'EKTY KOSMICHESKOI BIOLOGII]

L. F. GOROVOL, T. B. KASATKINA, A. F. POPOVA, and E. L. KORDIUM Leningrad, Izdatel'stvo Nauka (Problemy Kosmicheskoi Biologii. Vol. 69), 1991, 232 p. In Russian. refs
Copyright

Methods are described for investigating the growth and development of pileate mushrooms and blue-green and monocellular green algae under conditions of space flight. Particular attention is given to special installations (Kvadrat and Trapezia) constructed for growing several generations of mushrooms and algae under microgravity or other extreme conditions such as ionizing radiation, UV light, magnetic fields, and for studies of these effects on growth of mushrooms and algae. Results are presented on morphological, cytological, and biochemical effects of microgravity and hypogravity in mushrooms and algae. I.S.

A92-25429* National Aeronautics and Space Administration. Marshall Space Flight Center, Huntsville, AL.

THE SOLUBILITY OF THE TETRAGONAL FORM OF HEN EGG WHITE LYSOZYME FROM PH 4.0 TO 5.4

ELIZABETH CACIOPPO and MARC L. PUSEY (NASA, Marshall Space Flight Center, Huntsville, AL) Journal of Crystal Growth (ISSN 0022-0248), vol. 114, no. 3, Nov. 1991, p. 286-292. Research supported by Universities Space Research Association. refs Copyright

Hen egg white lysozyme solubilities in the presence of the tetragonal crystal form have been determined. Conditions investigated cover the pH range 4.0 to 5.4, varying from 2.0 to 7.0 percent NaCl concentrations and from 4 to 25 °C. In all instances, the solubilities were found to increase with temperature and decrease with increasing salt concentration. The effects of pH were more complex, showing a decreasing solubility with increasing pH at low salt concentration and an increasing solubility with increasing pH at high salt concentration. Author

A92-26012

THE GROOMING AND MOTOR ACTIVITIES OF RATS UNDER CONDITIONS OF HYPERBARIA [GRUMING I DVGATEL'NAIA AKTIVNOST' KRYV V USLOVIAKH GIPERBARII]

A. I. SLEDKOV Kosmicheskaya Biologiya i Aviakosmicheskaya Meditsina (ISSN 0321-5044), vol. 25, Nov.-Dec. 1991, p. 30-33. In Russian. refs Copyright

The effect of hyperbaric environment on the grooming and motor activities of rats and on their blood content of corticosterone was investigated in animals exposed to hyperbaric atmospheres of O₂-N₂ (at 10 kg/sq cm pressure) and O₂-He (at 10 and 40 kg/sq cm). It was found that hyperbaria caused significant increases in the motor and grooming activities in rats exposed to either O₂-N₂ or O₂-He atmosphere; plasma contents of serum corticosterone also increased (more than twice). The return to normal activity took place faster after exposures to 10 kg/sq cm than after higher pressure. I.S.

A92-26020

A MATHEMATICAL APPROACH TO THE ASSESSMENT OF THE ACCURACY OF PHYSIOLOGICAL PARAMETER MEASUREMENTS PERFORMED BY DIFFERENT METHODS [MATEMATICHESKII PODKHOD K OTSENKE TOCHNOSTI IZMERENII FIZIOLOGICHESKOGO PARAMETRA RAZLICHNYMI METODAMI]

N. V. PRAVETSKII, A. M. NOSOVSKII, and S. F. KHOLIN Kosmicheskaya Biologiya i Aviakosmicheskaya Meditsina (ISSN 0321-5044), vol. 25, Nov.-Dec. 1991, p. 53-55. In Russian. refs Copyright

Mathematical formulas were developed for calculating the relative accuracy of the values of a physiological parameter obtained using different measurement methods. The approach was verified using, as an example, data on the stroke volume and the minute volume in healthy individuals (obtained from a data base compiled by Pravetskii, 1986), when these parameters were measured by two methods: the Fick method and the thermodilution method described by Gaiton (1969). I.S.

A92-26021

BASIC APPROACHES TO SPACECRAFT STUDIES OF THE BIOLOGICAL EFFECT OF HEAVY IONS OF GALACTIC COSMIC RAYS [OSNOVNYE PODKHODY K IZUCHENIIU BIOLOGICHESKOGO DEISTVIA TIAZHELYKH IONOV GALAKTICHESKIKH KOSMICHESKIKH LUCHEI V ISSLEDOVANIYAKH NA KOSMICHESKIKH APPARATAKH]

L. V. NEVZGODINA and E. N. MAKSIMOVA Kosmicheskaya Biologiya i Aviakosmicheskaya Meditsina (ISSN 0321-5044), vol. 25, Nov.-Dec. 1991, p. 55-57. In Russian. refs Copyright

It is argued that the basic approach that should be adopted in investigations of the biological effect of heavy-ion radiation (HIR) from galactic cosmic rays is the analysis of final manifestations of radiobiological reactions, such as cell inactivation and cell death

(rather than merely the rate of mutation or the rate of appearance of aberrant cell structures). The choice of biological objects for studying the effect of HIR should be dictated by the feasibility of studying, in the particular object, the amount of injury and the rate of recovery both on the cellular and the organism levels. It is emphasized that the viability of the metabolic apparatus should be measured not only under optimal conditions of enzyme reactivity but also under conditions of extreme temperatures, overload, vibration, pressure, and humidity. I.S.

A92-26022

ANALYSIS OF THE PROTEIN CONTENT IN BLOOD PLASMA OF RATS AFTER THEIR FLIGHT ABOARD THE BIOSATELLITE COSMOS-1887, USING TWO-DIMENSIONAL ELECTROPHORESIS [ANALIZ BELKOVOGO SOSTAVA PLAZMY KROVI KRYV POSLE POLETA NA BIOSPUTNIKE 'KOSMOS-1887' S ISPOL'ZOVANIEM METODA DVUKHMERNOGO ELEKTROFOREZA]

O. N. LARINA Kosmicheskaya Biologiya i Aviakosmicheskaya Meditsina (ISSN 0321-5044), vol. 25, Nov.-Dec. 1991, p. 57, 58. In Russian. refs Copyright

The effect of a space flight on the total protein content and on individual proteins of rat blood plasma was investigated by analyzing plasma proteins of rats flown for 12.5 days aboard Cosmos-1887, using the Anderson and Anderson method of 2D electrophoresis. A comparison of data obtained before and after flight with data on synchronous controls showed that, while the total protein contents of experimental rats and ground controls were similar, the concentrations of albumin in flown rats decreased and those of globulin increased. Four of the flown rats (of the total group of nine) displayed increases of basic polypeptides analogous in the position to the alpha-chain of human fibrinogen. The same samples showed abnormal distributions of proteins among various molecular weight subfractions. I.S.

A92-26023

STUDIES OF THE BIOLOGICAL ACTIVITY OF A NIDUS VESPAE EXTRACT IN ANIMALS SUBJECTED TO PHYSICAL LOADS [IZUCHENIE BIOLOGICHESKOI AKTIVNOSTI NASTOIKI NIDUS VESPAE V USLOVIAKH FIZICHESKOI NAGRUZKI]

V. N. KOSTIUCHENKOV and N. F. FARASHCHUK Kosmicheskaya Biologiya i Aviakosmicheskaya Meditsina (ISSN 0321-5044), vol. 25, Nov.-Dec. 1991, p. 58, 59. In Russian. refs Copyright

Results are presented on studies of the effect of a nidus vespaee (wasp nest) extract on the biological activity of rats. It is shown that injections of the extract (in amounts from 1 to 3 ml/kg-body-weight) resulted in increased work capacity and in amelioration of the unfavorable stress reactions to maximal physical loads. I.S.

A92-26024

CHARACTERISTICS OF BEHAVIORAL REACTIONS OF RATS EXPOSED TO CONSTANT ELECTRIC FIELDS OF DIFFERENT VOLTAGE [OSOBENNOSTI POVEDENCHESKIKH REAKTSII KRYV PRI VOZDEISTVII POSTOYANNYKH ELEKTRICHESKIKH POLEI RAZLICHNOI NAPIAZHENNOSTI]

N. M. GROMYKO and O. L. KRIVODAEVA (Tsentr Mediko-Biologicheskikh i Ekologicheskikh Issledovaniy, Jurmala, Latvia) Fiziologicheskii Zhurnal SSSR (ISSN 0015-329X), vol. 77, May 1991, p. 1-6. In Russian. refs Copyright

The effect of exposures of rats to constant electric fields (CEFs) on their behavioral reactions was investigated by recording the characteristics of conditioned-reflex responses of the animals to food and pain after 4-hr-long daily exposures for 30 days to CEFs in the 30-160 kV/m voltage range. It was found that increases of voltage cause decelerations of responses, decreases in the levels of locomotor and orientation activities, and an eventual disappearance of the reflex extinction processes. The system that

51 LIFE SCIENCES (GENERAL)

was found to be most sensitive to CEFs is the system of negative emotional responses. I.S.

A92-26025

THE ROLE OF SPECIFIC AND NONSPECIFIC AFFERENT SYSTEMS IN THE MECHANISM OF CHANGES IN CORTICAL EVOKED RESPONSES TO VIBRATION [ROL' SPETSIFICHESKIKH I NESPEITSIFICHESKIKH AFFERENTNYKH SISTEM V MEKHANIZME IZMENENII VYZVANNYKH OTVETOV KORY PRI VIBRATSII]

S. M. MINASIAN, O. G. BAKLAVADZHIAN, S. G. SAAKIAN, and TS. I. ADAMIAN (Erevanskii Gosudarstvennyi Universitet, Yerevan, Armenia) Fiziologicheskii Zhurnal SSSR (ISSN 0015-329X), vol. 77, May 1991, p. 18-25. In Russian. refs
Copyright

A92-26332 National Aeronautics and Space Administration. Ames Research Center, Moffett Field, CA.

THE EFFECT OF HEAD-DOWN TILT AND WATER IMMERSION ON INTRACRANIAL PRESSURE IN NONHUMAN PRIMATES

LANNY C. KEIL (NASA, Ames Research Center, Moffett Field, CA), KENNETH H. MCKEEVER (Ohio State University, Columbus), MICHAEL G. SKIDMORE, JOHN HINES (NASA, Ames Research Center, Moffett Field, CA), and WALTER B. SEVERS (Pennsylvania State University, Hershey) Aviation, Space, and Environmental Medicine (ISSN 0095-6562), vol. 63, March 1992, p. 181-185. refs

(Contract NCC2-127)

Copyright

Intracranial pressure (ICP) is investigated in primates during and after -6-deg head-down tilt (HDT) and immersion in water to examine the effects of the headward fluid shift related to spaceflight. Following the HDT the primates are subjected to head-out thermoneutral water immersion, and the ICP is subsequently measured. ICP is found to increase from 3.8 ± 1.1 to 5.3 ± 1.3 mm Hg during the horizontal control period. ICP stabilizes at -6.3 ± 1.3 mm Hg and then increases to -2.2 ± 1.9 mm Hg during partial immersion, and ICP subsequently returns to preimmersion levels after immersion. These data indicate that exposure to HDT or water immersion lead to an early sharp increase in ICP, and water immersion alone leads to higher ICP levels. A significant conclusion of the work is that the ICP did not approach pathological levels, and this finding is relevant to human spaceflight research. C.C.S.

A92-26334 National Aeronautics and Space Administration. Ames Research Center, Moffett Field, CA.

INFLUENCES OF CHEMICAL SYMPATHECTOMY, DEMEDULLATION, AND HINDLIMB SUSPENSION ON THE V(O₂)MAX OF RATS

CHRISTOPHER R. WOODMAN, CRAIG S. STUMP, LISA A. SEBASTIAN, and CHARLES M. TIPTON (Arizona, University, Tucson) Aviation, Space, and Environmental Medicine (ISSN 0095-6562), vol. 63, March 1992, p. 193-199. refs
(Contract NAG2-392; NGT-50493)

Copyright

The contributions of catecholamines from the adrenal medulla to the reduction in maximal oxygen consumption is investigated in chemically sympathectomized rats. The rats are injected with saline and chemically sympathectomized, and approximately half of the rats are surgically demedullated. The subjects undergo head-down suspension for two weeks and are examined in terms of submaximal mechanical efficiency, treadmill run time, and maximal oxygen consumption. Rats with adrenal medullas and injected with saline demonstrate reduced levels of maximal O consumption, whereas chemically sympathectomized rats with adrenal medullas showed no significant reduction. Reduced levels of maximal O consumption is also noted in the sympathectomized demedullated rats. The paper concludes that circulating epinephrine enhances the attenuation of the decrease in the maximal O consumption caused by chemical sympathectomy. C.C.S.

A92-26548 National Aeronautics and Space Administration. Ames Research Center, Moffett Field, CA.

INTERMITTENT ACCELERATION AS A COUNTERMEASURE TO SOLEUS MUSCLE ATROPHY

DOMINICK S. D'AUNNO, RONALD R. ROBINSON, GREGORY S. SMITH, DONALD B. THOMASON, and FRANK W. BOOTH (Texas, University, Houston) Journal of Applied Physiology (ISSN 8750-7587), vol. 72, Feb. 1992, p. 428-433. refs
(Contract NAG2-239; NAGW-70)

Copyright

The effectiveness of using intermittent acceleration as a countermeasure to muscle atrophy was investigated in rats subjected to 7 days of hindlimb suspension interrupted by daily periods of 1.2 g acceleration, for 15-min periods evenly spaced over 12-hr interval. It was found that this regimen, when repeated for 7 days, failed to completely maintain the mass of soleus muscle, which was 84 percent of control. I.S.

A92-26549 National Aeronautics and Space Administration. Ames Research Center, Moffett Field, CA.

EFFECTS OF A SIMULATED MICROGRAVITY MODEL ON CELL STRUCTURE AND FUNCTION IN RAT TESTIS AND EPIDIDYMIS

JILL A. HADLEY, JOSEPH C. HALL, AMI O'BRIEN, and RICHARD BALL (Pennsylvania State University, University Park) Journal of Applied Physiology (ISSN 8750-7587), vol. 72, Feb. 1992, p. 748-759. Research supported by NSF. refs

(Contract NCC2-370; NAS9-17416)

Copyright

The effect of simulated microgravity on the structure and function of the testis and epididymis cells was investigated in rats subjected to 7 days of tail suspension. Results of a histological examination revealed presence of disorganized seminiferous tubules and accumulation of large multinucleated cells and spermatids in the lumen of the epididymis. In addition, decreases in the content of testis protein and in testosterone levels in the testis, the interstitial fluid, and the epididymis were observed. I.S.

A92-27494

TYROSINE HYDROXYLASE ACTIVITY IN DROSOPHILA VIRILIS UNDER NORMAL CONDITIONS AND HEAT STRESS [AKTIVNOST' TIROZINGIDROKSILAZY U DROSOPHILA VIRILIS V NORME I PRI TEPLVOM STRESSE]

I. IU. RAUSHENBAKH, N. A. CHENTSOVA, L. V. SHUMNAIA, T. M. KHEBODAROVA, and L. I. SEROVA (AN SSSR, Institut Tsitologii i Genetiki, Novosibirsk, USSR) Akademiia Nauk SSSR, Doklady (ISSN 0002-3264), vol. 321, no. 3, 1991, p. 612-615. In Russian. refs

Copyright

Data are presented which demonstrate the activity of tyrosine hydroxylase in *Drosophila virilis* under normal conditions and changes in the ferment activity under heat stress and hybridization of RNA of the *Drosophila virilis* imago with the coding sequence of tyrosine hydroxylase in rats. The results obtained agree with those reported by Neckameyer et al. (1986). Details of the experiments are presented. V.L.

A92-27600

DYNAMICS OF KIDNEY TISSUE AND VESSEL CHANGES IN WHITE RATS DUE TO ACUTE COLD STRESS [DINAMIKA SOSUDISTO-TKANEVYKH IZMENENII V POCHKAKH BELYKH KRYIS PRI OSTROM KHOLODOVOM STRESSE]

O. T. DEVONAEV, F. KH. SHARIPOV, and L. E. ETINGEN (Tadzhikskii Gosudarstvennyi Meditsinskii Institut, Dushanbe, Tajikistan) Akademiia Nauk Tadzhikskoi SSR, Doklady (ISSN 0002-3469), vol. 33, no. 12, 1990, p. 843-846. In Russian. refs
Copyright

The effect of acute cold stress on the structure of the kidney tissues and vessels of mammals was investigated in rats that were exposed for 7 hrs to a temperature of -16 C, while the control group remained at room temperature. Results of histological examinations performed on the 1st, 3rd, 7th, 14th, 21st, 28th,

45th, and 90th day after the cold exposure showed that the changes (including hemorrhages, vascular plethora, and suppression of mitosis) caused by acute exposure to cold involved mainly the epithelial membranes of the convoluted tubules and the kidney venules. I.S.

A92-27635

THE CHARACTERISTICS OF STRUCTURAL CHANGES IN MEMBRANES OF THE RECTUM OF ANIMALS IN THE PROCESS OF ADAPTATION TO HIGH ALTITUDE [K OSOBNOSTI STRUKTURNYKH IZMENENII V OBOLOCHKAKH PRIAMOGO OTDELA TOLSTOGO KISHECHNKA EKSPERIMENTAL'NYKH ZHIVOTNYKH V PERIOD ADAPTATSII K USLOVIAM VYSOKOGOR'IA]

SH. IU. IUSUPOVA and F. KH. SHARIPOV (Tadzhikskii Gosudarstvennyi Meditsinskii Institut, Dushanbe, Tajikistan) Akademiia Nauk Tadzhikskoi SSR, Doklady (ISSN 0002-3469), vol. 34, no. 2, 1991, p. 127-129. In Russian. refs Copyright

The effect of relocation to high altitude on the microstructure of rectal membrane tissues was investigated in rabbits relocated to a region 3375 m above sea level and maintained there for up to 30 days in roofed corrals, while the control rabbits were maintained in a valley, at an altitude of 820 m. Results of histological examinations of the mucous membranes of the rectum of animals sacrificed 1 week after relocation disclosed multiple point-size hemorrhages in the anal area of the rectum, indicating changes in vessel permeability. After 2 weeks, all rectal membranes in experimental animals exhibited signs of capillary widening, accompanied by perivascular edema. After 30 days, the tissue changes caused by relocation to high altitude began to disappear. I.S.

A92-28236

NOVEL MAJOR ARCHAEABACTERIAL GROUP FROM MARINE PLANKTON

JED A. FUHRMAN, KIRK MCCALLUM, and ALISON A. DAVIS (Southern California, University, Los Angeles, CA) Nature (ISSN 0028-0836), vol. 356, March 12, 1992, p. 148, 149. Research supported by NSF. refs Copyright

16S rRNA sequences obtained from Pacific Ocean bacterioplankton samples collected from depths of 100 and 500 m are reported. Sequences are found among these which are only distantly related to those of any organisms previously characterized by 16S rRNA sequences, with similarities in the nearest such relatives (extreme thermophiles) approximately the same as those between animals and plants. It is suggested that these sequences are from a previously undescribed archaeobacterial group that may have diverged from the ancestors of characterized organisms very early in evolution. C.D.

A92-28370

CONTENT AND COMPOSITION OF FREE FATTY ACIDS IN THE SARCOPLASMIC RETICULUM MEMBRANES AFTER EXPOSURE TO IONIZING RADIATION [VMIST I SKLAD VIL'NIKH ZHIRNIKH KISLOT U MEMBRANAKH SARKOPLAZMATICHNOGO RETIKULUMU PISLIA DII IONIZUIUCHOI RADIATSII]

IU. V. STEPANOV, V. M. VOITSITS'KII, V. S. SABKO, L. N. BOGATS'KA, and M. E. KUCHERENKO (Kiiivskii Derzhavnyi Universitet, Kiev, Ukraine) Akademiia Nauk Ukrain'skoi RSR, Dopovidi, Matematika, Prirodovnavstvo, Tekhnichni Nauki (ISSN 0868-8052), May 1991, p. 142-145. In Ukrainian. refs Copyright

A92-28384

ULTRASTRUCTURAL ORGANIZATION OF CHLORELLA CELLS CULTIVATED ON A SOLID MEDIUM IN MICROGRAVITY [UL'TRASTRUKTURNA ORGANIZATSIIA KLITIN KHLORELI, VIROSHCHENIKH NA TVERDOMU POZHIVNOMU SEREDOVISHCHI V UMOVAKH MIKROGRAVITATSII]

A. F. POPOVA, K. M. SITNIK, E. L. KORDIUM, G. S. NECHITAIILO, and O. L. MASHINS'KII (AN URSR, Institut Botaniki, Kiev, Ukrainian SSR) Akademiia Nauk Ukrain'skoi RSR, Dopovidi, Matematika, Prirodovnavstvo, Tekhnichni Nauki (ISSN 0868-8052), Aug. 1991, p. 154-157. In Ukrainian. refs Copyright

Chlorella cells grown for 30 days on board the Mir space station are found to differ from the control cells in their ultrastructure and relative volumes of the organelles and cell inclusions. Some of these changes are observed only in the chlorella cells cultivated on a solid medium. The observed changes in the submicroscopic organization of the chlorella cells grown on a solid medium in microgravity must be taken into account in developing techniques for plant growth in space. V.L.

N92-18113# Rensselaer Polytechnic Inst., Troy, NY.

PHYLOGENETIC RELATIONSHIPS AMONG SUBSURFACE MICROORGANISMS

S. A. NIERZWICKI-BAUER 1991 10 p (Contract DE-FG02-90ER-60989)

(DE92-004421; DOE/ER-60989/2) Avail: NTIS HC/MF A02

This project involves the development of group specific 16S ribosomal RNA-targeted oligonucleotide hybridization probes for the rapid detection of specific types of subsurface organisms (e.g., groups of microbes that share certain physiological traits). Major accomplishments for the period of 6/91 to 12/1/91 are described. Nine new probes have been synthesized on the basis of published 16S rRNA sequence data from the Ribosomal Database Project. We have initiated rapid screening of many of the subsurface microbial isolates obtained from the P24 borehole at the Savannah River Site. To date, we have screened approximately 50 percent of the isolates from P24. We have optimized our hybridization technique, and have developed a cell blot hybridization technique to screen 96 samples on a single blot. This is much faster than reading 96 individual slides. Preliminary experiments have been carried out which indicate specific nutrients can be used to amplify rRNA only in those organisms capable of metabolizing those nutrients. DOE

N92-18132# International Centre for Theoretical Physics, Trieste (Italy).

ON THE TRANSITION PERIOD FROM CHEMICAL TO BIOLOGICAL EVOLUTION

J. CHELA-FLORES Jun. 1991 11 p

(DE92-609049; IC-91/127) Avail: NTIS HC/MF A03

We discuss the consequences of the hypothesis that biological evolution was contemporary with an important event in chemical evolution, namely, the induction of a small chiral bias by the electroweak neutral interaction, amplified by the Salam enhancement factor, which we discuss in terms of familiar crystallographic terms. DOE

N92-18257# University of Southern Illinois, Springfield. School of Medicine.

THE EFFECTS OF EXERCISE ON PHARMACOKINETICS AND PHARMACODYNAMICS OF PHYSOSTIGMINE IN RATS Final Report, 16 Nov. 1987 - 15 Aug. 1990

S. M. SOMANI, P. BUCKENMEYER, M. DASILVA, S. N. DUBE, and L. FITZPATRICK 15 Feb. 1991 148 p (Contract DAMA17-88-C-8024)

(AD-A241867) Avail: NTIS HC/MF A07 CSCL 06/5

This report deals with the effect of acute and trained exercise on pharmacodynamics (cholinesterase activity), pharmacokinetics and biochemical parameters in the rat after physostigmine (Phy) administration. Dose-response studies of Phy and ChE inhibition *in vivo* indicated that a dose of 70 micrograms/kg of Phy inhibited about 30 percent of ChE activity in RBC. This dose was used throughout these exercise studies in consultation with USAMRDC. The oxygen consumption, respiratory exchange ratio (RER) and heat production showed a positive linear relationship in young and adult rats at different levels of exercise. However, significant differences were found in oxygen consumption and caloric

expenditure in young vs. adult rats. Different levels of acute exercise affect the ChE activity in RBC and heart and alter the Phy-induced ChE activity in RBC and the brain. GRA

N92-18757# International Centre for Theoretical Physics, Trieste (Italy).

GLOBAL MODELS FOR THE BIOMECHANICS OF GREEN PLANTS, PART 2

A. R. BESTMAN Dec. 1990 8 p
(DE92-603590; IC-90/474-PT-2) Avail: NTIS HC/MF A02

This paper examines the situation when the flow is not fully developed while the aspect ratio may not be small. Even for the low Reynolds situation, the problem is now nonlinear. Analytical solutions for the problem are found by asymptotic approximation. The method makes use of finite Fourier cosine and sine transforms. These solutions are discussed quantitatively. DOE

N92-18758# International Centre for Theoretical Physics, Trieste (Italy).

GLOBAL MODELS FOR THE BIOMECHANICS OF GREEN PLANTS, PART 3

A. R. BESTMAN Dec. 1990 9 p
(DE92-603591; IC-90/475-PT-3) Avail: NTIS HC/MF A02

As a result of dehydration, there are daily changes in the stem diameter of green plants. This transient phenomenon is addressed in this paper. It is assumed that a small time perturbation is superimposed on an otherwise constant radius. By employing the Laplace transforms, analytical solutions are developed for this peculiar phenomenon. These results are discussed quantitatively. DOE

N92-18887# California Univ., Berkeley.

MECHANISMS OF ACTION OF HEAVY METALS AND ASBESTOS ON CULTURED ANIMAL CELLS: ADAPTATION, TRANSFORMATION AND PROGRESSION

H. RUBIN 1991 131 p
(Contract DE-AS03-79EV-10277)
(DE92-004101; DOE/EV-10277/T2) Avail: NTIS HC/MF A07

Living organisms are exposed to and affected by a variety of physical and chemical environmental factors. Among these are a number of chemical agents which seriously modify the normal functioning and growth of biological systems. The general purpose of this project was to determine some of the effects of several important chemicals on living cells and to investigate the molecular mechanisms whereby these external agents affected cellular structure, physiology, metabolism, and growth. Our focus was on several environmental constituents, including asbestos and the heavy metals cadmium, mercury, lead, and nickel, which gave both short-term and long-term effects on various organisms and consequently are of serious public health concern. DOE

N92-18974# Toronto Univ. (Ontario). Dept. of Mechanical Engineering.

BUBBLE NUCLEATION THRESHOLD IN DECOMPLEMENTED PLASMA

C. A. WARD, D. YEE, D. MCCULLOUGH, and W. D. FRASER (Defence and Civil Inst. of Environmental Medicine, North York, Ontario) In AGARD, High Altitude and High Acceleration Protection for Military Aircrew 4 p Oct. 1991 Sponsored in part by Defence and Civil Inst. of Environmental Medicine, North York, Ontario

Copyright Avail: NTIS HC/MF A12; Non-NATO Nationals requests available only from AGARD/Scientific Publications Executive

Previous work has indicated that rabbits that are more susceptible to decompression sickness (DCS) are also more sensitive to complement activation by air bubbles, and that rabbits can be protected from DCS if they are pharmacologically decomplemented before they are subjected to the pressure profile. We have investigated a possible means by which decomplementing a rabbit could protect it from DCS. Since DCS is thought to be produced by bubbles that are formed in the tissues of an animal because of its tissues becoming oversaturated with dissolved gas as the animal undergoes a pressure profile, we have investigated

the possibility that decomplementing an animal protects it from DCS by making it more difficult to form bubbles in one of the tissues of primary concern, blood plasma. This investigation was performed with three test liquids: (1) water; (2) native rabbit plasma; and (3) decomplemented plasma. We find that the threshold for bubble nucleation in water is greater than that in either plasma or decomplemented plasma, but we do not find any difference between the nucleation threshold of the two types of plasma. Thus, the indications are that the protection from DCS that results from decomplementing a rabbit does not appear to develop because of a change in the nucleation threshold of the decomplemented plasma. Author

N92-18982# Air Force Systems Command, Brooks AFB, TX. Crew Technology Div.

HEMODYNAMIC RESPONSES TO PRESSURE BREATHING DURING +GZ (PBG) IN SWINE

J. W. BURNS, J. W. FANTON, and J. L. DESMOND In AGARD, High Altitude and High Acceleration Protection for Military Aircrew 5 p Oct. 1991

Copyright Avail: NTIS HC/MF A12; Non-NATO Nationals requests available only from AGARD/Scientific Publications Executive

Twelve chronically instrumented, unanesthetized, miniature swine were used to investigate the hemodynamic interrelationships of positive pressure breathing at G (PBG), the anti-G straining maneuver (AGSM), and the G-suit, during gradual onset rate (GOR) and simulated aerial combat maneuver (SACM) +Gz profiles. Maximum left ventricular pressure (LVP) and aortic pressure (AP) of over 300 mmHg, and left ventricular end-diastolic pressure (LVEDP) and right ventricular end-diastolic pressure (RVEDP) of over 160 mmHg and 100 mmHg, respectively, were common during the GOR and SACM exposures at 9 +Gz using an extended coverage G-suit (ECGS). A concurrent, substantial increase in intrathoracic pressure attenuated transmural vascular pressures within the thorax. The performance of the ECGS was significantly better than the abdominal bladder G-suit (ABGS), with or without PBG. A PBG effect could not be demonstrated while using the ECGS, during either the GOR or SACM profiles. Author

N92-19636# Missouri Univ., Columbia.

EFFECTS OF LIQUID DESICCANTS ON AIRBORNE MICROORGANISMS: LABORATORY SET UP, PROCEDURE DEVELOPMENT, AND PRELIMINARY MEASUREMENTS Ph.D. Thesis

K. A. ROBERTSON-DEMERS Aug. 1991 100 p
(Contract DE-AC05-76OR-00033)
(DE92-004749; DOE/OR-00033/T454) Avail: NTIS HC/MF A05

Airborne microorganisms are present in all indoor environments including homes, office, schools, and hospitals. These organisms have been found to be responsible for many acute diseases, infections, and allergies. The direct consequences of illnesses and human discomfort is loss of productivity and increased medical costs. Therefore, the removal of these organisms from indoor environments is of great interest. One method that has great potential for removing airborne microorganisms is a liquid desiccant based air conditioning system for removing airborne microorganisms. Various liquid desiccants including lithium chloride, calcium chloride, and triethylene glycol have been reported to have several advantages such as air disinfectant properties, capability to control humidity and temperature, and removal of cell fragments as well as living cells. However, very few systematic studies are available in the literature. Therefore, this research had four objectives: (1) to carry out an extensive literature survey regarding sources of microorganisms, sampling methods, and present methods of removal; (2) to set up a microbiology laboratory and to develop an in vitro exposure procedure for the purpose of systematically studying effects of desiccants on airborne microorganisms; (3) to perform in vitro studies to assess desiccant effectiveness; and (4) to determine relative efficiencies of two airborne sampling devices. DOE

N92-19911# Corvallis Environmental Research Lab., OR.
TWO DIFFERENT APPROACHES FOR CONTROL AND MEASUREMENT OF PLANT FUNCTIONS IN CLOSED ENVIRONMENTAL CHAMBERS

C. MCFARLANE, T. PFLEEGER, H. D. PAYER, W. SCHMOLKE, and D. STRUBE (Gesellschaft fuer Strahlen- und Umweltforschung m.b.H., Munich, Germany, F.R.) 1991 21 p Submitted for publication (PB92-108067; EPA/600/D-91/231) Copyright Avail: NTIS HC/MF A03 CSCL 06/2

Two approaches are described for the control and measurement of plant functions in environmental chambers; one approach was developed at the US EPA Research Lab., and the other developed at the GSF (Research Center for Environment and Health) in Munich, Germany. Both labs needed experimental studies performed under a variety of physical and chemical conditions that can only be faithfully reproduced in the absence of environmental disturbances, typical of field and greenhouse studies. The different goals of each facility determined the different approaches to control and measurement. Both labs have many ideas that can be useful to researchers studying the interactions associated with plants (botany) and pollutants. Author

52

AEROSPACE MEDICINE

Includes physiological factors; biological effects of radiation; and effects of weightlessness on man and animals.

A92-25251

PHYSIOLOGICAL-HYGIENIC ASPECTS OF INCREASING THE HEAT RESISTANCE IN HUMANS (REVIEW OF THE LITERATURE) [FIZIOLOGO-GIGIENICHESKIE ASPEKTY POVYSHENIIA TEPLOVOI USTOICHIVOSTI CHELOVEKA /OBZOR LITERATURY/]

V. P. KOVALENKO and V. V. SKORNIKOV Voenno-Meditsinskii Zhurnal (ISSN 0026-9050), Nov. 1991, p. 39-41. In Russian. refs Copyright

The paper reviews results of investigations of the effects of age, sex, the health condition and constitutional parameters, physical training, water consumption, and the degree of thermal adaptation of an individual on the ability of the human organism to maintain stable body temperature and work capacity. Special attention is given to the characteristics of age, physical condition, and health that should be taken into account when military personnel is selected for transfer into hot climate zones and to the measures designed to increase the heat resistance of these individuals. I.S.

A92-25252

FUNCTIONAL STATE OF THE CARDIOVASCULAR SYSTEM IN FIGHTER PILOTS WITH MITRAL VALVE PROLAPSE [FUNKTSIONAL'NOE SOSTOIANIE SERDECHNO-SOSUDISTOI SISTEMY PRI PROLAPSE MITRAL'NOGO KLAPANA U LETCHIKOV ISTREBITEL'NOI AVIATSII]

V. P. ZAKHAROV and A. V. KONDAKOV Voenno-Meditsinskii Zhurnal (ISSN 0026-9050), Nov. 1991, p. 44-47. In Russian. Copyright

The effect of mitral valve prolapse (MVP) on the functional state of the cardiovascular system in fighter and bomber pilots and on their capacity to fly at high Gz was investigated in 250 subjects with different sensitivities to gravitational centrifugal load. It was found that, out of 37 pilots with lowered tolerance to centrifugal load, 15 had MVP and that the frequency and the severity of arrhythmias in these subjects caused by +Gz overload depended on the number of prolapsed valves and the degree of prolapse. It is suggested that the absence of arrhythmia at rest and during submaximal physical exercise, and a satisfactory work capacity in pilots with MVP should not be used as indices of

good tolerance to +Gz above 6 Gz. It was found that the 2D echocardiogram represents the most effective method for diagnosing mild MVP without expressed mitral regurgitation. I.S.

A92-25253

TOLERANCE TO CHEST-TO-BACK (+GX) AND HEAD-TO-FEET (+GZ) OVERLOADS DURING DRUG-INDUCED HYPOHYDRATION (PERENOSIMOST' POPERECHNYKH /+GX/ I PRODOL'NYKH /+GZ/ PEREGRUZOK PRI FARMAKOLOGICHESKOI GIPOGIDRATATSII)

V. B. NOSKOV, V. I. LUK'IANIUK, T. V. SOKOLOVA, and A. R. KOTOVSKAIA Kosmicheskaiia Biologiia i Aviakosmicheskaiia Meditsina (ISSN 0321-5044), vol. 25, Sept.-Oct. 1991, p. 4-6. In Russian. refs

Copyright

The effect of hypohydration induced by intake of 40 mg furosemide on the tolerance to chest-to-back (+Gx) and head-to-feet (+Gz) acceleration was investigated in healthy humans subjected to rotation in a 7.5-m-arm centrifuge. The results of ECG examinations, ear pulsograms, measurements of pressure in the arm and the ear-lobe vessels, and pneumograms performed during the centrifugation period showed that, after the intake of diuretic, the (+Gx) tolerance remained essentially unchanged, while the (+Gz) tolerance was good but required greater efforts. I.S.

A92-25254

RESPONSES OF THE REGIONAL VESSEL TONUS TO THE EFFECTS OF ORTHOSTATIC AND GRAVITATIONAL LOADS [REAKTSII REGIONARNOGO SOSUDISTOGO TONUSA PRI DEISTVII ORTOSTATICHESKOI I GRAVITATSIONNOI NAGRUZOK]

R. A. VARTBARONOV and E. V. BARANOVA Kosmicheskaiia Biologiia i Aviakosmicheskaiia Meditsina (ISSN 0321-5044), vol. 25, Sept.-Oct. 1991, p. 6-8. In Russian. refs

Copyright

The effects of active orthostasis and +Gz acceleration (to 5, 7, and 9 G for 30 sec at an onset rate of 1.0 G/sec in the horizontal and vertical position) on the tonus of the middle-finger vessels were investigated in six human subjects. The arterial pulse and the degree of the venous blood filling of the finger vessels were measured by photoplethysmography, when the sensor was at three different points, adjusted by raising or lowering the arm: at the level of the right atrium, and at 41 cm above and below this level. It was found that increases of the intravascular hydrostatic pressure caused decreases of the arterial pulse (i.e., increases of arterial tonus) and increases in the degree of the venous blood filling, particularly, in the horizontal position. I.S.

A92-25255

SOME CHARACTERISTICS OF HUMORAL IMMUNITY AND NONSPECIFIC RESISTANCE IN PILOTS [NEKOTORYE OSOBNOSTI GUMORAL'NOGO IMMUNITETA I NESPETSIFICHESKOI REZISTENTNOSTI Y LETCHIKOV]

A. A. BOCHENKOV, V. S. SMIRNOV, and V. V. GORANCHUK Kosmicheskaiia Biologiia i Aviakosmicheskaiia Meditsina (ISSN 0321-5044), vol. 25, Sept.-Oct. 1991, p. 8-10. In Russian. refs

Copyright

The responses of the human immune system to adverse effects of an air flight (such as emotional stress, hypoxia, noise, and vibration) were investigated in 134 pilots between the ages of 22 and 42. Compared with healthy control subjects, the pilots were found to exhibit a significant decline in the levels of IgA, IgM, IgG, C3, alpha-antitrypsin, and R-proteins. Correlation analysis of over 100 anthropometric, psychophysiological, and immune parameters, together with data from a questionnaire, were used to develop mathematical models to analyze the relationship between the personality features and humoral immunity of pilots. It is shown that, as the emotional strain increases, the emotional stability decreases and the levels of immunoglobulins decline. I.S.

A92-25256

GLYCEMIA AS A RISK FACTOR OF REDUCED TOLERANCE TO HYPOXIC HYPOXIA IN FLIGHT PERSONNEL [GLIKEMIIA KAK FAKTOR RISKA PONIZHENNOI PERENOSIMOSTI GIPOKSICHESKOI GIPOKSII U LETNOGO SOSTAVA]

A. P. IVANCHIKOV, V. N. DENISOV, V. M. MERKULOV, and T. L. KURAEVA Kosmicheskaya Biologiya i Aviakosmicheskaya Meditsina (ISSN 0321-5044), vol. 25, Sept.-Oct. 1991, p. 10-12. In Russian. refs

Copyright

The effect of increased levels of glycemia in pilots on the level of tolerance to hypoxia in flight (at the altitude of 5000-m simulated in a pressure chamber) was investigated in 61 human subjects 22-50 years of age. Results showed that all subjects could be grouped according to their response to hypoxia among three types: (1) no change (15.79 percent), (2) hypoglycemia (49.12 percent), and (3) hyperglycemia (35.09 percent). The subjects with low glycemic levels typically exhibited a low resistance to hypoxia. It is suggested that these three types of glycemic responses to hypoxia reflect three major pathways of biochemical adaptation of the body. I.S.

A92-25257

CHANGES IN THE ERYTHROCYTE MEMBRANES AND OF NA(+), K(+)-ATPASE IN PARTICIPANTS OF THE CANADIAN-SOVIET TRANS-ARCTIC SKI TREK [IZMENENIE STRUKTURNY MEMBRAN ERITROTSITOV I AKTIVNOSTI NA(+), K(+)-ATFAZY U UCHASTNIKOV SOVETSKO-KANADSKOGO TRANSARKTICHESKOGO LYZHNOGO PEREKHODA]

L. E. PANIN, V. G. KUNITSYN, and M. F. NEKRASOVA Kosmicheskaya Biologiya i Aviakosmicheskaya Meditsina (ISSN 0321-5044), vol. 25, Sept.-Oct. 1991, p. 12-15. In Russian. refs

Copyright

The effect of the extreme conditions of a long-distance trans-Arctic ski trek on the characteristics of the erythrocyte membranes and the activity of Na(+), K(+)-ATPase was investigated in the 13 participants of the 1988 Canadian-USSR ski passage that started at Dikson village (USSR) and ended in Ottawa (Canada) via the North Pole. The results of examinations revealed changes in the rheological properties of the erythrocyte membranes and their electric conductivity as a function of temperature. During the progress of the ski trek, the activity of Na(+), K(+)-ATPase of the erythrocyte membranes decreased, with the decrease correlating with structural changes observed in the membranes. I.S.

A92-25258

FUNCTIONAL PROPERTIES OF BLOOD PROTEINS IN HIGHLY TRAINED ATHLETES [K VOPROSU O FUNKTSIONAL'NYKH SVOISTVAKH BELKOV KROVI U VYSOKOTRENIROVANNYKH SPORTSMENOV]

N. V. TOLKACHEVA, S. V. KONOSHENKO, M. M. LEVACHEV, F. A. MEDVEDEV, V. L. LUPINOVICH, and O. V. NIKOLENKO Kosmicheskaya Biologiya i Aviakosmicheskaya Meditsina (ISSN 0321-5044), vol. 25, Sept.-Oct. 1991, p. 15-17. In Russian. refs

Copyright

The effect of intense physical exercise on the binding capacity of lipids and oxidized lipids of the human blood albumin was investigated by analyzing the constituents of albumin preparations from the blood serum of trained athletes (three bicycle racers) and of healthy control subjects. Results indicate that the adaptation to regular strenuous exercise leads to increases in the metabolism of omega-3 fatty acids and in the content of albumin-bound products of lipid oxidation. In addition, the hemoglobin affinity for molecular oxygen decreases and the ATP concentration in red blood cells increases. I.S.

A92-25260

ROLE OF EXTERNAL RESPIRATION IN THE FORMATION OF THE AUTONOMIC COMPONENT OF MOTION SICKNESS [O ROLI VNESHNEGO DYKHANIYA V FORMIROVANII VEGETATIVNOGO KOMPONENTA BOLEZNI DVIZHENIYA]

V. M. BARANOV, M. A. TIKHONOV, E. I. MATSNEV, M. I. VOLKOV, A. S. MARKIN, and K. S. KHAIDAKOV Kosmicheskaya Biologiya i Aviakosmicheskaya Meditsina (ISSN 0321-5044), vol. 25, Sept.-Oct. 1991, p. 20-24. In Russian. refs

Copyright

Changes in the respiration pattern and in the parameters of gas exchange, gas content, and acid-base equilibrium due to the development of motion sickness were measured in 22 human subjects with different motion-sickness susceptibilities, who were placed into head-down position (-8 deg) and rocked in parallel swings for 120 min. It was found that subjects susceptible to motion sickness developed signs of hyperventilation concomitant with alveolar-arterial hypocapnia and respiratory alkalosis. It was also found that the use of a hypercapnic atmosphere (4 percent CO₂, 96 percent air) eliminated these changes in gas-composition and acid-base equilibrium in the blood and, in 70 percent subjects, alleviated vestibular symptoms of motion sickness and increased the time before the onset of motion sickness. I.S.

A92-25263

VARIATIONS IN THE PROSTAGLANDIN CONTENT AND IN SOME PARAMETERS OF LIPID METABOLISM IN HUMANS UNDER CONDITIONS OF PROLONGED HYPOKINESIA [DINAMIKA SODERZHANIYA PROSTAGLANDINOV I NEKOTORYKH POKAZATELEI LIPIDNOGO OBMENA U CHELOVEKA V USLOVIYAKH DLITEL'NOI GIPOKINEZII]

V. P. NAIDINA, I. P. LARINA, E. E. ZHARKOVSKAYA, and I. V. SUKHANOV Kosmicheskaya Biologiya i Aviakosmicheskaya Meditsina (ISSN 0321-5044), vol. 25, Sept.-Oct. 1991, p. 33-36. In Russian. refs

Copyright

The effectiveness of periodic exercise to counteract the effects of long-term hypokinesia (370-day-long bed rest with -5 deg head-down tilt) on the contents of prostaglandins PGE and PGE(2a) and of fatty acids in serum and erythrocyte membranes was investigated in subjects of two groups. Group A subjects exercised from the beginning of the bed-rest period, while Group B subjects began exercising only on the 120th day. Results show that, by the end of the 50th day, subjects of both groups exhibited decreased contents of lipids in the blood and the erythrocyte membranes, mainly due to decreases in polyunsaturated fatty acids. However, the fatty acid levels returned to normal or above. The levels of prostaglandins measured at day 50 were somewhat above the control level but by day 170 the prostaglandin levels decreased drastically and remained low, indicating serious changes in the lipid metabolism at a cellular level. I.S.

A92-25264

EMERGENCY DEPOSITION OF CALCIUM BY PLASMA AND NONPLASMA BUFFER SYSTEMS - THE EFFECT OF LONG-TERM HYPOKINESIA [REAKTSIIA SROCHNOGO DEPONIROVANIYA KAL'TSIYA PLAZMENNymi I VNEPLAZMENNymi BUFRNymi SISTEMAMI - VLIANIE USLOVII DLITEL'NOI GIPOKINEZII]

I. M. LARINA, T. M. SMIRNOVA, and I. V. SUKHANOV Kosmicheskaya Biologiya i Aviakosmicheskaya Meditsina (ISSN 0321-5044), vol. 25, Sept.-Oct. 1991, p. 36-41. In Russian. refs

Copyright

The effect of 100-day-long bed rest with -6-deg head-down tilt on the parameters of Ca-binding and -mobilizing systems in humans was investigated by monitoring mineral compositions of urine and blood and by measuring blood concentrations of protein, Ca(2+), parathyroid hormone, and calcitonin in subjects who were injected with solutions of calcium gluconate. Results showed that long-term hypokinesia caused decreases of the calcium-binding capacity of the nonplasma pool, changes in the kinetic characteristics of the Ca-binding reaction, and increases in the responses of mineralotropic hormones to induced hypercalcemia. I.S.

A92-25266

THE INFORMATION CONTENT OF SOME HORMONAL INDICES AND CYCLIC NUCLEOTIDES IN THE ESTIMATION AND PREDICTION OF RESISTANCE TO THE EFFECT OF ACUTE HYPOXIA IN OPERATORS [INFORMATIVNOST' NEKOTORYKH GORMONAL'NYKH POKAZATELEI I TSIKLICHESKIKH NUKLEOTIDOV V OTSENKE I PROGNOZE USTOICHIVOSTI K VOZDEISTVIU OSTROI GIPOKSII PRI OPERATORSKOI DEIATEL'NOSTI]

I. P. BOBROVNITSKII, T. V. PETROVA, I. P. IAKOVLEVA, and S. V. KALINKIN Kosmicheskaya Biologiya i Aviakosmicheskaya Meditsina (ISSN 0321-5044), vol. 25, Sept.-Oct. 1991, p. 43-46. In Russian. refs
Copyright

Results are presented from a study in which 16 healthy human subjects 25 to 40 years of age were asked to perform physical exercise under conditions of acute hypoxia (9-12 percent O₂), and the levels of insulin, cortisol, and cyclic nucleotides in these subjects were measured in order to determine the value of these quantities for estimating tolerance to acute hypoxia. Results show that acute hypoxia caused increases of cortisol, insulin, somatotropin, epinephrine, norepinephrine, and cAMP in the urine, as well as increases of cAMP in lymphocytes and blood plasma. It was found that subjects with higher levels of plasma insulin and urine catecholamines exhibited better tolerance to hypoxia. The ability to better tolerate acute hypoxia was combined with a higher activity of the sympathoadrenal system, and increases of cortisol and cAMP in lymphocytes. I.S.

A92-25274

NIGHT-SLEEP PATTERN AND THE SUSCEPTIBILITY TO MOTION SICKNESS [STRUKTURA NOCHNOGO SNA I PREDRASPOLOZHENNOST' K BOLEZNI DVIZHENIIA]

S. N. LIPOVENKO Kosmicheskaya Biologiya i Aviakosmicheskaya Meditsina (ISSN 0321-5044), vol. 25, Sept.-Oct. 1991, p. 61. In Russian. refs
Copyright

The relation between motion-sickness susceptibility and the pattern of the night sleep in healthy humans was investigated by comparing polygraphic data of night sleep obtained (together with EECs, electromyograms, electrooculograms, heart rate measurements, and records of cutaneous galvanic reflex) on three groups of subjects with different motion-sickness susceptibilities, before and after exposures to vestibular stimuli. It is shown that subjects with the lowest motion-sickness susceptibility (i.e., the most stable vestibulovegetative system) exhibited the highest stability of the somnogenic mechanisms. I.S.

A92-25401

HYPERVENTILATION [GIPERVENTILIATSIYA]

VIKTOR B. MALKIN and ELENA P. GORA Moscow, Izdatel'stvo Nauka (Problemy Kosmicheskoi Biologii. Vol. 70), 1990, 184 p. In Russian. refs
(ISBN 5-02-005854-8) Copyright

The book reviews work on the effect of hyperventilation on the physiological functions of the human organism. Results are presented on the use of voluntary hyperventilation of various intensities for studies of the effects of age, sex, and individual characteristics on the responses to hyperventilation of the cardiorespiratory, cardiovascular, and central nervous systems. Special attention is given to the occurrence of involuntary hyperventilation as a means of adaptation to hypoxia and to the use of controlled voluntary hyperventilation to counteract the effects of altitude hypoxia. I.S.

A92-25956

USE OF AIR TRANSPORT IN DELIVERING MEDICAL HELP TO VICTIMS IN THE AREA OF AN EARTHQUAKE EPICENTER [ISPOL'ZOVANIE AVIATSIONNOGO TRANSPORTA PRI OKAZANII MEDITSINSKOI POMOSHCHI POSTRADEVSHIM V OCHAGE ZEMLETRIASENIIA]

S. A. BUGROV, V. V. LITOVCHENKO, and V. N. GOLOVCHITS

Voenno-Meditsinskii Zhurnal (ISSN 0026-9050), Sept. 1991, p. 54-57. In Russian.

Copyright

The paper presents a report on the activity of military aviation (large military transport aircraft and helicopters) in the aftermath of the December 1988 earthquake in Armenia. The efficiency of aircraft-related operations in delivering first aid and evacuating wounded victims is demonstrated and causes of the deficiencies that occurred in the course of these activities are analyzed. These activities encompassed three stages: (1) the determination of the degree of destruction and on-the-spot first aid and evacuation (Dec. 7-8); (2) planned evacuation of victims (Dec. 9-12); and (3) activities directed toward ameliorating the consequences of the earthquake (Dec. 13-20). I.S.

A92-25957

BIORHYTHMICITY IN DECOMPRESSION SICKNESS [BIORITMOLOGICHESKIE ASPEKTY ZABOLEVAEMOSTI DEKOMPRESSIONNOI BOLEZNI'U]

I. A. POGORELOV, E. G. SHIMANOVICH, A. I. CHERNENKO, and A. N. ANTROPOV Voenno-Meditsinskii Zhurnal (ISSN 0026-9050), Sept. 1991, p. 57-59. In Russian. refs
Copyright

The circadian and seasonal rhythms in the rate of occurrence of decompression sickness (DS) were investigated using data collected in the course of 17 years on young (19-23 yr old) divers operating in the Barents Sea at depths between 40 and 180 m. Results are presented showing that the rate of DS occurrence was higher in the period between midnight and noon than in the following 12 hours, reflecting the generally unfavorable effect of work during night hours on the physiological condition of the human body. The greatest numbers of DS cases occurred during the months of seasonal weather changes (March and September-November), when the human organism is adapting to new conditions. It is suggested that divers working at the most unfavorable periods should be afforded longer periods of decompression and with an increased content of atmospheric oxygen and should undergo stricter health-control procedures than at other times. I.S.

A92-26004

EXTERNAL RESPIRATION AND GAS EXCHANGE DURING SPACE FLIGHTS [VNESHNEE DYKHANIE I GAZOOBMEN V KOSMICHESKIKH POLETAKH]

V. M. BARANOV, M. A. TIKHONOV, N. M. ASIAMOLOVA, M. I. VOLKOV, A. N. KOTOV, G. E. SAVCHENKO, and K. S. KHAIDAKOV Kosmicheskaya Biologiya i Aviakosmicheskaya Meditsina (ISSN 0321-5044), vol. 25, Nov.-Dec. 1991, p. 4-8. In Russian. refs

Copyright

Using results obtained in earlier space flights and simulated flight studies, the effects of microgravity, acceleration, and changes in the composition and pressure of the spacecraft-cabin and the space suit atmospheres on the parameters of the respiratory function of humans are examined. It is shown that the effects include changes in the respiration biomechanics, the gas-diffusion and ventilation-perfusion ratios in lungs, the regulation of respiration and of respiratory muscles, the degrees of the hydration and blood filling of lungs, and the acid-base equilibrium and blood gases. In addition, a combination of these effects may cause functional and morphological changes in the lung tissue. I.S.

A92-26006

HEMATOLOGIC INDICES IN COSMONAUTS DURING A SPACE FLIGHT [GEMATOLOGICHESKIE POKAZATELI U KOSMONAVTOV V USLOVIIKH KOSMICHESKOGO POLETA]

M. P. KALANDAROVA, V. V. POLIAKOV, I. B. GONCHAROV, and L. I. TIKHONOVA Kosmicheskaya Biologiya i Aviakosmicheskaya Meditsina (ISSN 0321-5044), vol. 25, Nov.-Dec. 1991, p. 11-14. In Russian. refs

Copyright

The effect of space flight on hematologic indices of the space crew was investigated in crew members of the third and the fourth

prime crew flights (EO-3 and EO-4). It was found that hematological parameters in the subjects were not affected by the space flight, indicating the intactness of the blood regeneration system during these periods. However, some changes were recorded in the numbers of neutrophils, myelocytes, and lymphocytes; also observed were erythrocytic hypochromia and anisocytosis. A comparison of the results of preflight and postflight bone-marrow examinations revealed slight increases in lymphocytosis, monocytosis, and plasma-cell counts as a result of space flight.

I.S.

A92-26009

EXTERNAL RESPIRATION AND GAS EXCHANGE IN HUMANS UNDERGOING SIMULATED DIVING AT 350 M [VNESHNEE DYKHANIE I GAZOGBMEN CHELOVEKA PRI IMITIROVANNYKH POGRUZHENIIAKH NA 350 M]

A. V. SUVOROV, A. E. MIKHENKO, and V. V. ISAENKO
Kosmicheskaya Biologiya i Aviakosmicheskaya Meditsina (ISSN 0321-5044), vol. 25, Nov.-Dec. 1991, p. 21-23. In Russian. refs
Copyright

The effect of deep-sea diving on the external respiration and gas exchange of humans was investigated in subjects staying for up to 21 days in a barochamber at about 3.5 MPa. The external respiration and gas exchange characteristics were measured under conditions of rest and maximum physical load. It was found that, at rest, the basic respiratory parameters remained unchanged but the respiratory reserves decreased under the effect of increased gas density. Exposures to maximum work load led to the retention of CO₂ and, consequently, to the inability to continue physical work. The exposure to 3.5 MPa caused significant respiratory changes in the first three days, followed by considerable normalization and constancy during the rest of the exposure.

I.S.

A92-26010

THE DEVELOPMENT OF DECOMPRESSION REGIMENS FOR EXCURSION DIVES USING DATA FROM PROLONGED EXPOSURES TO 21 ATA [RAZRABOTKA REZHIMOV DEKOMPRESSII DLIYA EKSKURSIONNYKH SPUSKOV IZ USLOVII DITEL'NOGO PREBYVANIYA POD DAVLENIEM DO 21 ATA]

S. V. RODCHENKOV, I. P. POLESHCHUK, V. K. SKUDIN, and A. I. DMITRUK
Kosmicheskaya Biologiya i Aviakosmicheskaya Meditsina (ISSN 0321-5044), vol. 25, Nov.-Dec. 1991, p. 23-27. In Russian. refs
Copyright

A92-26011

METABOLIC CHANGES DURING HYPERBARIC OXYGENATION [IZMENENIE OBMENA VESHCHESTV PRI GIPERBARICHESKOI OKSIGENATSII]

L. G. MEDVEDEV, V. I. KULESHOV, and S. B. SHEVCHENKO
Kosmicheskaya Biologiya i Aviakosmicheskaya Meditsina (ISSN 0321-5044), vol. 25, Nov.-Dec. 1991, p. 27-30. In Russian. refs
Copyright

The effect of high partial O₂ pressure on human metabolism was investigated in 12 subjects exposed to compressed-oxygen atmosphere (pO₂ = 0.25 MPa) for up to 90 min, by measuring the activity of enzymes of carbohydrate and protein metabolism and the levels of electrolytes in subjects' blood before and after the exposure. The results obtained were interpreted as demonstrations of a toxic effect of oxygen on the metabolism. It was also found that the optimal exposure times were different for different individuals.

I.S.

A92-26013

FUNCTIONAL CHANGES IN THE CARDIOVASCULAR SYSTEM AND THEIR PHARMACOLOGICAL CORRECTION DURING IMMERSION IN A DIVING SUIT [FUNKTSIONAL'NIE IZMENENIYA SERDECHNO-SOSUDISTOI SISTEMY I IKH FARMAKOLOGICHESKAYA KORREKTSIYA V USLOVIIAKH KOSTIUMNOI IMMERSII]

V. S. SHASHKOV, N. G. LAKOTA, A. I. MODIN, and S. L.

IL'INA
Kosmicheskaya Biologiya i Aviakosmicheskaya Meditsina (ISSN 0321-5044), vol. 25, Nov.-Dec. 1991, p. 33-36. In Russian. refs

Copyright

The effect of prolonged immersion in water of human subjects wearing a diving suit on the parameters of the cardiovascular system was investigated in 39 men subjected to immersion for periods from 3 hrs to 3 days. Data were obtained on circulation responses to the upright and supine body positions during immersion as well as on the exercise tolerance after immersion. Results of clinical observations and instrumented measurements showed that the cardiovascular effects of immersion were similar to those caused by hypogravity. No difference was found between the vertical and horizontal variants. It is suggested that immersion is a better model for simulating hypogravity than some currently used procedures. It was found that the administration of synocarb, synogluton, sydstigluton, and estrigluton preparations were all effective in promoting cardiovascular correction.

I.S.

A92-26014

SOME CHARACTERISTICS OF THE MOTOR FUNCTION OF DIGESTIVE ORGANS IN HUMANS WITH DIFFERENT SUSCEPTIBILITIES TO MOTION SICKNESS [NEKOTORYE OSOBENOSTI MOTORNOI FUNKTSII ORGANOV PISHCHEVARENIYA U LITS S RAZLICHNOI STEPEN'YU REZISTENTNOSTI K BOLEZNI DVIZHENIYA]

B. V. AFONIN, V. A. ROGOV, L. G. RUVINOVA, B. I. POLIAKOV, and S. L. INOZEMTSEV
Kosmicheskaya Biologiya i Aviakosmicheskaya Meditsina (ISSN 0321-5044), vol. 25, Nov.-Dec. 1991, p. 36-39. In Russian. refs

Copyright

The effect of three exposures to Coriolis acceleration on the frequency and amplitude of contractions by the fasting stomach was investigated in 22 subjects, six of whom were resistant to motion-sickness while 16 were susceptible. All subjects underwent gastroduodenoscopy after tests and four subjects in each group were also subjected to echography to measure the gall bladder contractility in response to glucose-milk loads. It was found that, in resistant subjects, the motor activity of the stomach increased slightly, while in the susceptible group the motor activity was inhibited. Ultrasonic gall bladder examinations showed that susceptible subjects developed a faster and stronger gall bladder contraction than did the resistant subjects, indicating a more prolonged duration of the gall excretion phase in susceptible subjects.

I.S.

A92-26015

NUCLEASE ACTIVITY OF MICROORGANISMS AND THE PROBLEM OF MONITORING THE STATE OF AUTOMICROFLORA IN OPERATORS IN HERMETICALLY SEALED ENVIRONMENTS [NUKLEAZNAYA AKTIVNOST' MIKROORGANIZMOV I PROBLEMA KONTROLIA ZA SOSTOYANIEM AUTOMICROFLORY OPERATOROV GERMETICHNO ZAMKNUTYKH OB'EKTOV]

N. A. POLIKARPOV, A. N. VIKTOROV, and A. F. KHALANGOT
Kosmicheskaya Biologiya i Aviakosmicheskaya Meditsina (ISSN 0321-5044), vol. 25, Nov.-Dec. 1991, p. 39-42. In Russian. refs
Copyright

The safety, with respect to microbial infections, of operators working in hermetically sealed environments such as space vehicles and underwater chambers was considered by investigating the DNA and/or RNA activities of microbial pathogens (Shigella, Salmonella, and Staphylococcus aureus) and potential microbial pathogens in three groups of subjects: (1) clinically healthy subjects with normal microflora, (2) somatic patients with intestinal dysbacteriosis, and (3) patients with acute intestinal diseases. Results of microscopic examinations and of nuclease assays of samples from these subjects showed that the critical size of depolymerization zones of nucleic acids in the gel media were significantly different for normal and for potentially pathogenic intestinal microorganisms.

I.S.

A92-26017

THE CHARACTERISTICS OF PROLACTIN SECRETION IN RESPONSE TO DIFFERENT DEGREES OF VESTIBULAR-ANALYZER LESIONS [OSOBENOSTI SEKRETSII PROLAKTINA PRI RAZLICHNYKH UROVNIYAKH PORAZHENiIA VESTIBULIATORNOGO ANALIZATORA]

N. V. BOIKO, T. S. KOLMAKOVA, E. N. NESTERENKO, and F. IA. GROISBERG Kosmicheskaya Biologiya i Aviakosmicheskaya Meditsina (ISSN 0321-5044), vol. 25, Nov.-Dec. 1991, p. 46-48. In Russian. refs

Copyright

Changes in the prolactin secretion in response to lesions in the vestibular analyzer were measured in patients that were in the middle of a vestibular-dysfunction crisis or during the period of compensation, and the results were compared with clinical symptoms and the levels of the vestibular problem. It was found that patients with acute vestibular disorders and with central vestibular-analyzer lesions exhibited above-normal levels of blood prolactin, which were significantly higher than in patients with peripheral vestibular syndrome at the compensation stage. It is suggested that hyperprolactinemia during central vestibular dysfunction is a manifestation of a dopamine deficiency in the tuberoinfundibular region. I.S.

A92-26018

ASSESSMENT OF THE HEALTH STATUS AND THE CHARACTERISTICS OF METABOLISM IN COSMONAUTS DURING A PROLONGED SPACE FLIGHT [OTSENKA SOSTOYANIYA ZDOROV'IA I OSOBENOSTEI OBMENA VESHCHESTV U KOSMONAVTOV V USLOVIYAKH DLITEL'NOGO KOSMICHESKOGO POLETA]

A. I. GRIGOR'EV, V. V. POLIAKOV, V. B. NOSKOV, and V. I. KOZHARINOV Kosmicheskaya Biologiya i Aviakosmicheskaya Meditsina (ISSN 0321-5044), vol. 25, Nov.-Dec. 1991, p. 48, 49. In Russian. refs

Copyright

The effect of a long-term (up to 200 days) space flight on the biochemical indices of cosmonauts' blood was investigated using minute quantities of blood drawn from the finger tip of the subjects and analysis by means of special diagnostic strips and an instrumental system (Refliotron) that was adopted to the conditions of space flight. The results of microanalyses were correlated and were used to assess the conditions of metabolism and to make diagnoses of metabolic abnormalities in the myocardium, liver, pancreas, and other organs. I.S.

A92-26329

PHASIC SKIN CONDUCTANCE ACTIVITY AND MOTION SICKNESS

JOHN F. GOLDING (RAF, Institute of Aviation Medicine, Farnborough, England) Aviation, Space, and Environmental Medicine (ISSN 0095-6562), vol. 63, March 1992, p. 165-171. refs

Copyright

The relationship between sweating and motion sickness is investigated with attention given to the differences associated with two measuring sites and two methods of signal analysis. Subjects undergo either cross-coupled motion challenge, vertical/horizontal sinusoidal linear motion, or simple head movements. The two recording sites tested are the palmar finger and the forehead; the signal-analysis techniques include the tonic skin-conductance level (SCL) and the phasic skin-conductance responses (SCRs). Additionally three subjects are examined in terms of sweating responses by means of mass spectrometry for skin water vapor with the N₂ gas-flow method. The results indicate that phasic SCRs measured at the forehead correlate better with the motion sickness onset and recovery than SCRs relating to palmar finger data and better than any tonic SCL methods. C.C.S.

A92-26331

G-ENDURANCE DURING HEAT STRESS AND BALANCED PRESSURE BREATHING

U. I. BALLDIN and J. SIEGBORN (National Defence Research

Establishment, Div. of Aviation Medicine, Linköping, Sweden) Aviation, Space, and Environmental Medicine (ISSN 0095-6562), vol. 63, March 1992, p. 177-180. refs

Copyright

The effect of heat stress and balanced pressure breathing during G (PGB) on G-endurance was investigated. Ten fighter pilots wearing anti-G-suits with increased bladder coverage were warmed to 38.2 C and exposed to 15-s periods at 4.5 and 7 G in a heated human centrifuge gondola until exhaustion during PBG and normal breathing (NB). During both NB and PBG, the rectal temperature rose to a mean of 38.3 C, and the dehydration was about 1.2 kg. With NB the endurance was a mean of 254 s, while it was 300 s with PBG (n.s.). Oxygen saturation and ratings of perceived exertion were mainly unchanged, while the maximum heart rate decreased by a mean of 13 bpm during PBG. In conclusion, the G-endurance was not deteriorated with PBG, in comparison with NB, during heat stress. In conjunction with experiences from other studies, however, it emphasizes the importance of avoiding heat stress and dehydration during G-loads, even with PBG. Author

A92-26335

DECOMPRESSION SICKNESS - AN INCREASING RISK FOR THE PRIVATE PILOT

WILLIAM R. BLACK and ROY L. DEHART (Oklahoma, University, Oklahoma City) Aviation, Space, and Environmental Medicine (ISSN 0095-6562), vol. 63, March 1992, p. 200-202. refs

Copyright

Decompression sickness is not an appreciated hazard among the private pilot community. This is of growing concern with the increasing number of nonpressurized aircraft capable of flying to altitudes in excess of 5468 m (18,000 ft). A case report is presented of a 42-year-old pilot who apparently experienced decompression sickness at flight level 250 which went unrecognized until several months after the incident. Author

A92-26336

ALTITUDE-INDUCED ARTERIAL GAS EMBOLISM - A CASE REPORT

FREDERICK W. RUDGE (USAF, School of Aerospace Medicine, Brooks AFB, TX) Aviation, Space, and Environmental Medicine (ISSN 0095-6562), vol. 63, March 1992, p. 203-205. refs

Copyright

Following a rapid decompression in an altitude chamber for routine training purposes, a 38-year-old altitude chamber technician developed rapid onset of mental dullness, right arm weakness, and sensory deficits. Immediate treatment with compression therapy in a hyperbaric chamber resulted in complete resolution. Ambient pressure changes great enough to result in arterial air embolism due to an explosive or rapid decompression have been described as a potential hazard in aviation, although no actual cases of such a phenomenon have been previously reported. The aeromedical considerations of this complication are discussed. Author

A92-26700

CLINICAL AVIATION MEDICINE (2ND REVISED AND ENLARGED EDITION)

RUSSELL B. RAYMAN (Lockheed Engineering and Sciences Co., Washington, DC) Philadelphia, PA, Lea & Febiger, 1990, 208 p. refs

(ISBN 0-8121-1248-2) Copyright

The book focuses on the application of clinical medicine in the field of aviation medicine. The diseases commonly encountered by a flight surgeon are discussed with special attention given to the conditions and their treatments which are of particular significance to a pilot. Topics discussed include internal medicine, orthopedics, neurology, ophthalmology, otolaryngology, cardiology, genitourinary diseases, dermatology, psychiatry, and oncology. The signs, the symptoms, the modes of treatment, and the prognoses of the diseases encountered in these fields are described, and their special significance for the flying ability of the pilot is

emphasized. Particular consideration is given to the side effects of commonly prescribed medications, particularly with respect to effects on the flying ability. I.S.

A92-27498

ESTIMATING THE ORGANISM'S NONSPECIFIC RESISTANCE FROM INDIVIDUAL REACTION TO HYPOXIC TESTING [OTSENKA NESPEITSIFICHESKOI REZISTENTNOSTI ORGANIZMA PO INDIVIDUAL'NOI REAKTSII NA TESTIRUIUSHCHEE GIPOKSICHESKOE VOZDEISTVIE]

IU. V. BUSHOV, A. P. PISANKO, F. V. OS'MININ, K. T. PROTASOV, and A. F. ERSHOV (NII Biologii i Biofiziki, Tomsk, Russia) Fiziologiya Cheloveka (ISSN 0131-1646), vol. 17, Nov.-Dec. 1991, p. 59-65. In Russian. refs
Copyright

The individual differences in the nonspecific reactions of humans to hypoxic tests were investigated in experiments where subjects were mountain climbers and healthy controls subjected to hypoxic tests (HTs) that included simulated ascents to 3.5 km in combination with physical exercise and orthostatic and breathing tests. The results revealed three types of individual reactions to HTs and, in particular, the existence of a sthenic type of organism, characterized by insignificant decreases of work capacity due to moderate hypoxia. A quick method is proposed for estimating nonspecific resistance of humans from individual reactions to HTs. I.S.

A92-27499

THE EFFECT OF THE METABOLIC PREPARATION RIKAVIT ON THE PROCESS OF HUMAN ADAPTATION TO HIGH ALTITUDES [VLIYANIE METABOLICHESKOGO PREPARATA RIKAVITA NA PROTSESS ADAPTATSII CHELOVEKA K GORNOI MESTNOSTI]

T. V. SEREBROVSKAIA, A. A. IVASHKEVICH, M. M. SEREDENKO, P. V. BELOSHITSKII, I. I. SAKHARCHUK, G. T. DENISENKO, and A. N. PISHCHALENKO (AN Ukrainy, Institut Fiziologii, Kiev, Ukraine) Fiziologiya Cheloveka (ISSN 0131-1646), vol. 17, Nov.-Dec. 1991, p. 73-80. In Russian. refs
Copyright

The effect of Rikavit (which contains 0.1 g riboxine, 0.05 g KCl, 0.1 g glutamic acid, 0.02 g ascorbic acid, 0.01 g nicotinamide, 0.002 g riboflavin, and 0.002 g pyridoxine) on the adaptation of humans to altitude hypoxia was investigated in mountain skiers lodging at a 2100 m altitude for 10 days and skiing at an altitude of 4200 m. It was found that oral administration of Rikavit resulted in increases of oxygen supply to body tissues, in improved efficiencies of the respiratory and cardiovascular systems, and in higher efficiency of oxidation in body tissues. The extents and the type of the observed changes varied depending on the metabolism of individual subjects. I.S.

A92-27500

DYNAMICS OF COMPETING INTERACTION BETWEEN VERBAL AND MANUAL ACTIVITIES DURING ADAPTATION AND READAPTATION AFTER TRANSMERIDIONAL FLIGHT [DINAMIKA KONKURENTNOGO VZAIMODEISTVIA VERBAL'NOI I MANUAL'NOI DEIATEL'NOSTI PRI ADAPTATSII I READAPTATSII POSLE TRANSMERIDIONAL'NOGO PERELETA]

N. V. VOL'F (AMN SSSR, Institut Fiziologii, Novosibirsk, USSR) Fiziologiya Cheloveka (ISSN 0131-1646), vol. 17, Nov.-Dec. 1991, p. 142-146. In Russian. refs
Copyright

The effects of adaptation and readaptation to quick transmeridional relocations on the characteristics of mutual interference during concurrent verbal and manual activities were investigated in right-handed male subjects flown from Novosibirsk to the East Coast (Reineke Island) and, after 20 days on the coast, back to Novosibirsk. To test for changes in concurrent verbal and manual activities, subjects were tested using a concurrent verbal-manual test (Ianson and Keng, 1983) in the beginning of the experiment, 2-5 days and 20 days following the first flight, and 2-5 days after the return to Novosibirsk. Results

show that the first periods of adaptation and readaptation were characterized by lowered asymmetry of the interference effect of the verbal load on the speed of tapping by the right and the left hands. After the flight in the eastern direction, subjects displayed a weaker interference of the left cerebral hemisphere in the morning hours and stronger interference in the right hemisphere in the evening. I.S.

A92-27504

ANALYSIS OF THE STAGES OF THE NIGHT SLEEP OF HUMAN SUBJECTS FROM THE STANDPOINT OF THE FUNCTIONAL QUANTIZATION OF THE VITAL ACTIVITY [ANALIZ ORGANIZATSII NOCHNOGO SNA CHELOVEKA S POZITSII FUNKTSIONAL'NOGO KVANTOVANIYA ZHIZNEDEIATEL'NOSTI]

IU. E. VAGIN and S. I. POSOKHOV (Moskovskaia Meditsinskaya Akademiya, Moscow, Russia) Akademiya Nauk SSSR, Doklady (ISSN 0002-3264), vol. 321, no. 5, 1991, p. 1115-1120. In Russian. refs
Copyright

The hierarchical structure of the night sleep of human subjects is examined in the light of the hypothesis of the system quantization of the physiological functions of the human organism. It is suggested, in particular, that sleep can be treated as a continuum of Delta and R sleep quanta whose function is to satisfy the information and psychic needs of the human brain. A mathematical analysis of the sleep stages in these terms indicates that the need for the Delta and R stages is satisfied alternatively and fractionally. V.L.

A92-27629

THE PRIMARY-REACTION SYNDROME CAUSED BY A RADIATION EXPOSURE (REVIEW OF THE LITERATURE) [SINDROM PERVICHNOI REAKTSII NA OBLUCHENIE /OBZOR LITERATURY/]

V. I. LEGEZA Voenno-Meditsinskii Zhurnal (ISSN 0026-9050), Oct. 1991, p. 20-22. In Russian. refs
Copyright

Recent data are presented that support the modern concepts of the pathophysiological and neurochemical mechanisms of the primary reactions to irradiation at the level of a nuclear explosion. Special attention is given to a review of research conducted on the search for pharmacological means for preventing and/or alleviating the primary-reaction syndrome. I.S.

A92-27630

THE CHARACTERISTICS OF PHYSIOLOGICAL REACTIONS OF AN ORGANISM DURING THE GENERATION OF MUSCULAR EFFORT NEEDED TO OPERATE CONTROL PEDALS [OSOBENNOSTI FIZIOLOGICHESKIKH REAKTSII ORGANIZMA PRI SOZDANII MYSHECHNYKH USILII NA PEDALIAKH UPRAVLENIIA]

V. V. BELIKOV Voenno-Meditsinskii Zhurnal (ISSN 0026-9050), Oct. 1991, p. 50, 51. In Russian. refs
Copyright

The capacity of a fighter pilot for maintaining, during high-G loads, a certain level of muscular effort needed to operate control pedals is investigated, with special attention given to the physiological reactions caused by the effort. In experiments, subjects were tied to the back of aircraft seats and were asked to maintain 50 to 100 kilogauss pressure on the control pedals for as long as it was physically possible, while their muscular stress and cardiovascular parameters were recorded continuously. Results of data analysis showed that the physiological reactions to pressure reached their maximal values right before the moment when the muscle strain had to be released due to physical incapability to maintain it any longer. I.S.

A92-27642

**PSYCHOPHYSIOLOGICAL TRAINING OF
MULTISEAT-AIRCRAFT FLIGHT PERSONNEL FOR
COORDINATING ACTIVITIES DURING EMERGENCY
SITUATIONS [PSIKHOFIZIOLOGICHESKAIA PODGOTOVKA
CHLENOV EKIPAZHEI MNOGOMESTNYKH LETATEL'NYKH
APPARATOV K VZAIMODEISTVIU V AVARIINNYKH
SITUATSIIAKH]**

A. N. RAZUMOV, O. A. KOSOLAPOV, and A. A. PIKALOV
Voenno-Meditsinskii Zhurnal (ISSN 0026-9050), Dec. 1991, p.
45-48. In Russian. refs

Copyright

It has been shown that nearly one half of flight accidents caused by a breakdown in flight of aircraft equipment could have been prevented if the crew had been trained to optimize the coordination of their individual activities in these situations. This paper describes a training method, consisting of a specially developed set of training control cards, for training crew members to coordinate their activity in various actual situations, such as the breakdown of an engine during the takeoff, horizontal flight, and touchdown on the gliding path, or the breakdown of a navigation instrument during these stages of flight. I.S.

N92-18025# Oakland Univ., Rochester, MI.

MECHANISMS FOR RADIATION DAMAGE IN DNA

M. D. SEVILLA Dec. 1991 27 p

(Contract DE-FG02-86ER-60455)

(DE91-019080; DOE/ER-60455/6) Avail: NTIS HC/MF A03

Recent work in our laboratory has been instrumental in the reformulation of the current model for radiation damage in DNA. We have found that radical ion distribution is a function of strandedness of the DNA. A new model for ion transport through DNA is proposed. We completed an extensive ab initio molecular orbital study of the ion radicals species involved in DNA radiation damage. In this effort, the ionization energies (IE), electron affinities (EA), relative energies, fully optimized structural parameters, and spin densities were determined. Joint work with Steven Swarts and Ken Wheeler of Wake Forest on yields of products on irradiation of DNA has also yielded new insights to radiation damage to DNA - specifically, the division between the direct and indirect effect. Perhaps our most important work during this period has been in the area of the interaction of thiyl radicals and oxygen as well as (DNA) peroxy radicals with thiols. The sulfinyl radical, RSO*, was not previously known to be a product of thiol- or carbon-based peroxy reaction with RSH. The structure of the thiyl peroxy radical, RSOO, was uncertain. The conversion of RSOO to the sulfonyl radical, RSO2, and the subsequent reaction with oxygen to form the sulfonyl peroxy radical, RSO2OO, had never been suggested in the literature. We have investigated the reactions of thiols with primary ion radicals in gamma-irradiated DNA and observed electron transfer from the thiol to the guanine cation radical. This is believed to be the major protective effect of thiols from the direct effect of radiation. Our work with peroxy radicals has also established that the ESR measured O-17 hyperfine couplings give a good estimate of the relative reactivity of the peroxy group and shows that the thiol peroxy radical cannot be a effective hydrogen abstracting agent. DOE

N92-18076# Army Biomedical Research and Development Lab., Fort Detrick, MD.

**TECHNOLOGY ASSESSMENT AND STRATEGY FOR
DEVELOPMENT OF A RAPID FIELD WATER MICROBIOLOGY
TEST KIT**

DAVID R. PRESTON and STEPHEN A. SCHAUB Sep. 1991
54 p

(AD-A243413; USABRDL-TR-9106) Avail: NTIS HC/MF A04
CSCL 06/6

A literature and market search of existing technology for the detection, identification, and quantification of microorganisms in water was conducted. Based upon the availability of technologies and their configurations, an assessment of the appropriate strategies to pursue for the near and long term development plans in development of the Rapid Field Bacteriology Test Kit was

performed. Near term technologies to improve the Army's capability to detect microorganisms would appear to be essentially improvements in versatility and measurement of coliform indicator organisms. New chromogenic and fluorogenic indicator substances associated with new substrates appear to be best suited for test kit development either for quantitative membrane filter tests or presence/absence and multiple fermentation tests. Test times, incubator requirements, and operator involvement appear to be similar to older technologies. Long term development would appear to favor such technologies as genetic probes with amplification of the hydrodized nucleic acid materials of positive samples, and some immunological based systems such as enzyme linked, immuno-sorbent assays. In both cases, the major problems would appear to be sample preparation and development of signal strengths from the reactions which would allow the user to see results in 1 hour. GRA

N92-18102# Michigan Univ., Ann Arbor.

**RADIOPHARMACEUTICALS FOR DIAGNOSIS AND
TREATMENT**

D. E. KUHL 1991 5 p

(Contract DE-FG02-88ER-60639)

(DE92-004065; DOE/ER-60639/4) Avail: NTIS HC/MF A01

In this grant period, we have continued our efforts in the areas of PE basic radiochemistry, radiopharmaceutical synthesis, and preclinical radiopharmaceutical evaluation. A new synthetic sequence, consisting of no-carrier-added fluorine-18 labeling of substituted benzaldehydes followed by reductive decarbonylation, has been developed. This new methodology can be applied to the fluorine-18 labeling of a wide variety of drugs not previously accessible through existing fluorine-18 labeling methods. Following up on a literature report that the ability to radiolabel aromatic rings can be predicted by C-13 NMR chemical shifts, we have examined the generality of this correlation in aromatic rings bearing a variety of substituents. Although the original correlation holds for nitro substituted anisaldehydes, it cannot be extended to other rings substitution patterns. We have examined the relationship of in vivo localization of various fluorine-18 labeled dopamine uptake inhibitors to their in vitro binding affinities and lipophilicities. We have found that remarkably small decreases in binding affinity result in dramatic losses of in vivo binding to the desired high affinity binding sites. In order to probe the effects of endogenous neurotransmitter on the in vivo binding of radiolabeled dopamine uptake inhibitors, we have examined the in vivo regional localization of (F-18)GBR 13119 after acute and chronic drug treatments which alter the endogenous levels of dopamine. We have found that acute changes in dopamine levels do not affect the binding of this radioligand, but chronic depletion of neurotransmitter results in down-regulation of the in vivo binding sites. DOE

N92-18296# California Univ., San Diego, La Jolla.

**THE MOLECULAR BASIS FOR UV RESPONSE OF CULTURED
HUMAN CELLS**

M. KARIN 1991 4 p

(Contract DE-FG03-86ER-60429)

(DE92-003766; DOE/ER-60429/T1) Avail: NTIS HC/MF A01

During the past year we have analyzed the mechanism by which UV and H2O2 increase the activity of AP-1 in HeLa cells. AP-1 is a dimeric protein complex composed of the fos and jun gene products. After UV irradiation of HeLa cells (or exposure to H2O2), expression of the c-jun gene rapidly increases at least 50-fold. This induction occurs through the previously identified AP-1 site in the c-jun promoter. This positive autoregulation is mediated by AP-1 complexes that are composed mostly of cJun. cJun is a phosphoprotein that undergoes complex changes in its phosphorylation state following exposure to phorbol esters, growth factors or transforming oncogenes. We show that UV irradiation causes increases in the phosphorylation of cJun. We have been trying to determine the common signal by which DNA damaging agents lead to activation of the UV response. We present evidence that oxidative stress may serve as a signal for AP-1 induction during the UV response. We are also trying to purify and characterize UVIC, a factor secreted from UV damaged cells which

protects non-irradiated cells from damage. We have identified UVIC as a 17 kDa polypeptide that retains radioprotective activity after SDS-PAGE and renaturation. We are currently scaling up the isolation and purification process. DOE

N92-18339# Oxford Univ. (England). Medical Engineering Unit.
PULSE OXIMETRY: THEORETICAL AND EXPERIMENTAL MODELS

J. P. DEKOCK and L. TARASSENKO 26 Jun. 1991 41 p
(OUCL-1885/91; ETN-92-90909) Avail: NTIS HC/MF A03

A model for understanding and quantifying the phenomena underlying pulse oximetry using an approach which combines both theoretical and empirical modeling is developed. The optical properties of whole blood were measured as a function of pathlength by transmission spectrophotometry using Red (R) (660 nm) and Infrared (IR) (950 nm) light emitting diodes as light sources. Readings were taken from a number of cuvettes of differing depths using diffusers to scatter the light before and after it interacts with the blood film. Twersky's theoretical model for the optical properties of whole blood gives the best fit to the experimental data. A simple theoretical model which takes into account the nonlinear relationship between optical density and pathlength in order to obtain an expression for the R/IR ratio, which relates the measurement of transmission at the two wavelengths, is also used. The R/IR ratio is found to be more or less independent of pathlength. Twersky's theoretical model, together with the simple model for obtaining an expression for the R/IR ratio, is concluded to provide a valid approach to the understanding of the phenomena undergoing pulse oximetry, as shown in the good correlation between the results predicted by the model and earlier, entirely experimental, in vitro experiments. ESA

N92-18419# Oakland Univ., Rochester, MI.
MECHANISMS FOR RADIATION DAMAGE IN DNA

M. D. SEVILLA Dec. 1991 17 p
(Contract DE-FG02-86ER-60455)
(DE91-019079; DOE/ER-60455/5) Avail: NTIS HC/MF A03

In this project we have proposed several mechanisms for radiation damage and recently radiation protection to DNA and its constituents, and have detailed a series of experiments utilizing electron spin resonance spectroscopy, HPLC and GC-mass spectroscopy to test the proposed mechanisms. In this years' work we have continued the investigation of the localization of the initial charges on DNA after irradiation through experiment and through the use of ab initio molecular orbital theory. The experimental results and MO calculations are in agreement that cytosine, not thymine, is likely the principal locus for excess charge; whereas guanine is confirmed as the initial site for the cationic charge. The mechanism for the anion localization on cytosine is clarified by MO calculations of DNA base pair and stacked base pair (GC/AT) ion radicals. In addition predictions made from a new model of ion transfer in DNA are tested and confirmed by an ESR investigation of irradiated single stranded DNA. In this years' effort in joint work with Wake Forest University we have also made excellent progress in the study of products produced from the direct effect of radiation on DNA. The release of unaltered bases and DNA base damage products are shown to be a function of hydration layer and evidence for a demarcation between the direct and indirect effect of radiation is presented. DNA base products from irradiations at ambient temperatures are shown to be those that would be predicted from ESR studies at low temperatures. In addition initial studies of radiation effects on DNA-protein complexes and certain sensitive amino acids have been initiated to shed light on the role of histones on DNA radiation damage. DOE

N92-18598# Michigan Univ., Ann Arbor. School of Public Health.

DEVELOPMENT OF A REVISED MATHEMATICAL MODEL OF THE GASTROINTESTINAL TRACT Ph.D. Thesis

A. BARKER Jan. 1991 181 p
(Contract DE-AC05-76OR-00033)
(DE92-004748; DOE/OR-00033/T453) Avail: NTIS HC/MF A09

The objectives of this research are as follows. First, to incorporate new biological data into a revised mathematical adult gastrointestinal tract model that includes: ingestion in both liquid and solid forms; consideration of absorption in the stomach, small intestine, ascending colon, transverse colon or not at all; gender and age of the adult; and whether the adult is a smoker or not. Next, to create a computer program in basic language for calculating residence times in each anatomical section of the GI tract for commonly used radionuclides. Also, to compare and contrast the new model with the ICRP 30 GI tract model in terms of physiological concepts, mathematical concepts, and revised residence times for several commonly used radionuclides. Finally, to determine whether the new model is sufficiently better than the current model to warrant its use as a replacement for the Eve model. DOE

N92-18799# Westinghouse Hanford Co., Richland, WA.
BENEFICIAL USES OF RADIATION

M. R. FOX Oct. 1991 13 p
(Contract DE-AC06-87RL-10930)
(DE92-003024; WHC-SA-1273) Avail: NTIS HC/MF A03

An overall decline in technical literacy within the American public has come at a time when technological advances are accelerating in the United States and around the world. This has led to a large communication gulf between the general public and the technologists. Nowhere is this more evident than with the topic of radiation. Regrettably, too few people know about the pervasiveness, amounts, and variabilities of sources of radiation. Nor do many people know that radiation has been used in beneficial ways for decades around the world. While the general public does not know of the scientific applications in which radiation has been employed, it has benefitted from these efforts. Thanks to the well know properties of radiation, scientific ingenuity has found many uses of radiation in chemical and agricultural research, biomedical research, in the diagnoses and treatment of hundreds of types of diseases, in industrial applications, food irradiation, and many other areas. This paper provides a sample of the types of applications in which radiation has been used to advance humankind. DOE

N92-18859# Central Inst. for the Deaf, Saint Louis, MO.
BINAURAL MASKING: AN ANALYSIS OF MODELS Final

Technical Report, 1 Apr. 1989 - 31 Jan. 1991
ROBERT H. GILKEY 21 Nov. 1991 29 p
(Contract AF-AFOSR-0302-89; AF PROJ. 2313)
(AD-A244392; AFOSR-91-1022TR) Avail: NTIS HC/MF A03
CSCL 06/3

The goal of this program of research has been to specify auditory processing in the presence of noisy backgrounds. A variety of experimental and modeling approaches have been employed to examine this processing. Overall the results suggest the importance of spectral and temporal comparisons in signal detection and suggest that similar processing underlies monaural and binaural detection. The introduction of masker energy in temporal intervals that did not overlap with the signal could be shown to either enhance or degrade detection performance, depending on the interaural parameters of the stimuli. Experiments on remote masking and suppression showed excitatory and inhibitory effects that extended across more than an octave. These results are being used to evaluate a nonlinear model of cochlear processing. The responses of subjects to individual stimuli (reproducible noise samples) were highly correlated between monaural and binaural conditions that had seemed dramatically different when the ensemble performance was considered (i.e., data averaged across noise samples). GRA

N92-18972# Advisory Group for Aerospace Research and Development, Neuilly-Sur-Seine (France). Aerospace Medical Panel.

HIGH ALTITUDE AND HIGH ACCELERATION PROTECTION FOR MILITARY AIRCREW

Oct. 1991 264 p In ENGLISH and FRENCH Symposium held in Pensacola, FL, 29-30 Apr. 1991

(AGARD-CP-516; ISBN-92-835-0638-3) Copyright Avail: NTIS HC/MF A12; Non-NATO Nationals requests available only from AGARD/Scientific Publications Executive

These proceedings include the technical evaluation report, the keynote address, and the 28 papers of the symposium. The papers addressed a variety of topics including (1) decompression sickness and ebullism at high altitude; (2) effects of high acceleration in terms of G-induced loss of consciousness (GLOC), positive pressure breathing (PBG), the anti-G straining maneuver (AGSM), and neck injury protection; (3) modeling effects of high acceleration on the cardiovascular system; (4) very high altitude protection; and (5) integrative protection equipment to high altitude, high acceleration, and other harmful stressors.

N92-18973# Air Force Systems Command, Brooks AFB, TX. Armstrong Lab.

DECOMPRESSION SICKNESS AND EBULLISM AT HIGH ALTITUDES

ANDREW A. PILMANIS and BARBARA J. STEGMANN (Krug Life Sciences, Inc., San Antonio, TX.) *In* AGARD, High Altitude and High Acceleration Protection for Military Aircrew 11 p Oct. 1991

Copyright Avail: NTIS HC/MF A12; Non-NATO Nationals requests available only from AGARD/Scientific Publications Executive

The use of high altitude air space for military activities exposes flight crews to the hazards of near vacuum ambient pressures. Both the U.S. Advanced Tactical Fighter and the National Aerospace Plane will travel at heights where unprotected exposure to the environment leads to severe physiological consequences, including decompression sickness (DCS) and ebullism. Information about DCS occurring at or above altitudes of 40,000 feet is minimal. Theoretically, bubble growth will be rapid and latency of symptoms short. The ultimate DCS consequences of such high exposures, even very short ones, may be influenced by the pre- and post-events of a rapid decompression (RD), including prebreathing, and post-exposure medical intervention. Ebullism, or the vaporization of body fluids, poses additional physiological risks to flight above 63,000 feet. Medical treatment protocols for ebullism in the event of accidental manned exposures to extreme altitudes do not exist. As research, training, and operational flights of new measures and treatment protocols becomes essential. Author

N92-18975# Air Force Systems Command, Brooks AFB, TX. High Altitude Protection Function.

THE 1990 HYPOBARIC DECOMPRESSION SICKNESS WORKSHOP: SUMMARY AND CONCLUSIONS

ANDREW A. PILMANIS, ed. *In* AGARD, High Altitude and High Acceleration Protection for Military Aircrew 4 p Oct. 1991 Workshop held at Brooks AFB, TX, Oct. 1990

Copyright Avail: NTIS HC/MF A12; Non-NATO Nationals requests available only from AGARD/Scientific Publications Executive

Decompression sickness resulting from exposure to the hypobaric environment was reviewed and discussed at a three-day workshop hosted by the U.S. Air Force in Oct. 1990. This milestone meeting updated the current understanding of this condition. Gaps in this understanding were identified based on input from both research and operational participants. The results of this workshop are summarized. Author

N92-18976# Krug Life Sciences, Inc., San Antonio, TX.

PREBREATHING AS A MEANS TO DECREASE THE INCIDENCE OF DECOMPRESSION SICKNESS AT ALTITUDE

BARBARA J. STEGMANN and ANDREW A. PILMANIS (Air Force Systems Command, Brooks AFB, TX.) *In* AGARD, High Altitude and High Acceleration Protection for Military Aircrew 8 p Oct. 1991

Copyright Avail: NTIS HC/MF A12; Non-NATO Nationals requests available only from AGARD/Scientific Publications Executive

Prebreathing with 100 percent oxygen for protection against serious decompression sickness (DCS) is standard practice in the U.S. Air Force (USAF). Before prebreathing became routine, there were 18 reported deaths directly related to altitude DCS. Since prebreathing has become instituted, only one death has been

reported. However, DCS cases still occur and are primarily associated with training in altitude chambers. At the Armstrong Laboratory (AL), Brooks Air Force Base, Texas, research on the use of prebreathing to enhance denitrogenation is directed at optimizing schedules for current operational requirements in both aviation and space. Concurrently, development of a decompression/denitrogenation computer is also underway. This analytical model is based on both laboratory and operational data bases, and will have both real-time and predictive capability. However, the accuracy of these data bases is in question. DCE reporting problems, inconsistencies in medical diagnosis, arbitrary classification of symptoms, historical variation in symptom definition, and the subjectiveness of intravascular bubble detection techniques must be taken into account before reasonable reliability can be applied to this model. Author

N92-18977# Air Force Systems Command, Brooks AFB, TX. Armstrong Lab.

G-INDUCED LOSS OF CONSCIOUSNESS ACCIDENTS: USAF EXPERIENCE 1982-1990

TERENCE J. LYONS, RICHARD HARDING, JAMES FREEMAN, and CAROLYN OAKLEY *In* AGARD, High Altitude and High Acceleration Protection for Military Aircrew 9 p Oct. 1991 Previously announced in IAA as A92-20719 Prepared in cooperation with Air Force Inspection and Safety Center, Norton AFB, CA

Copyright Avail: NTIS HC/MF A12; Non-NATO Nationals requests available only from AGARD/Scientific Publications Executive

A review of the 18 accidents attributable to loss of consciousness induced by high-G flight (G-LOC) is conducted to discuss potential acceleration-protection measures. The data show that all accidents are found to have significantly higher systolic blood pressure and fewer aircraft-specific flying hours than other pilots. The pilots seem to represent a typical cross section of the pilot pool in terms of personal variables. It is suggested that the most important variables contributing to the accidents are G duration, G magnitude, the use of G trousers, and experience with the aircraft in question. Author

N92-18978# Royal Air Force Inst. of Aviation Medicine, Farnborough (England).

PULMONARY EFFECTS OF HIGH-G AND POSITIVE PRESSURE BREATHING

DAVID H. GLAISTER *In* AGARD, High Altitude and High Acceleration Protection for Military Aircrew 4 p Oct. 1991

Copyright Avail: NTIS HC/MF A12; Non-NATO Nationals requests available only from AGARD/Scientific Publications Executive

Since positive pressure breathing (PPB) can provoke syncope even at low gravity, its use to support the circulation and prevent G-induced loss of consciousness (G-LOC) appears somewhat of a paradox. Furthermore, when right heart pressures are normally only a few mm Hg, an alveolar pressure of 65 mmHg produced by PPB appears alarming, and concern has been expressed as to the advisability of enhancing G protection. The effects of acceleration and pressure breathing on the circulation, particularly within the lungs, are examined, and it is concluded that when one considers pressure differentials across the walls of the major vessels and heart chambers, these concerns are largely unjustified. Author

N92-18979# Defence and Civil Inst. of Environmental Medicine, North York (Ontario).

MAXIMUM INTRA-THORACIC PRESSURE WITH PBG AND AGSM

F. BUICK, J. HARTLEY, and M. PECARIC *In* AGARD, High Altitude and High Acceleration Protection for Military Aircrew 9 p Oct. 1991

(DCIEM-91-43) Copyright Avail: NTIS HC/MF A12; Non-NATO Nationals requests available only from AGARD/Scientific Publications Executive

Positive pressure breathing during +Gz (PBG) and anti-G straining maneuvers (AGSM) each improve +Gz tolerance by increasing blood pressure through increases in intra-thoracic

pressure, but the maximal intra-thoracic pressure from their combined effect is not known. Six subjects performed: (1) maximal AGSM at +1Gz; (2) assisted PBG (constant 60 mm Hg) at +Gz; (3) submaximal AGSM at +Gz (enough to maintain peripheral vision); (4) maximal AGSM at +Gz; and (5) combined PBG and maximal AGSM at +Gz. They wore: Tactical Life Support System (TLSS) mask/helmet ensemble, CSU-15/P G-suit, and TLSS-style jerkin. Intra-thoracic pressure (Pes) was measured with a catheter tip pressure transducer in the esophagus. Gastric pressure (Pga) was also measured. For both Pes and Pga, there were no significant differences among experimental conditions (1), (4) and (5). Group mean Pes and Pga in these 3 conditions were 139 and 197 mm Hg, respectively. The similar results between maximal AGSM, and maximal AGSM and PBG are explained by: (1) limited support from the thoracic counter-pressure garment, and (2) the characteristics of the respiratory system. Author

N92-18980# Air Force Systems Command, Brooks AFB, TX. Crew Systems Directorate.

THE INFLUENCE OF HIGH, SUSTAINED ACCELERATION STRESS ON ELECTROMYOGRAPHIC ACTIVITY OF THE TRUNK AND LEG MUSCLES

LARRY P. KROCK and MARK W. CORNWALL. In AGARD, High Altitude and High Acceleration Protection for Military Aircrew 4 p Oct. 1991. Prepared in cooperation with Arizona State Univ., Flagstaff

Copyright Avail: NTIS HC/MF A12; Non-NATO Nationals requests available only from AGARD/Scientific Publications Executive

This study investigated the level and pattern of trunk and lower extremity muscle activity in aircrew performing the anti-G straining maneuver (AGSM) at high, sustained +Gz. Ten male, trained centrifuge riders experienced rapid onset profiles (4G/s) to +6 Gz, and sustained this level on the Armstrong Laboratory's Human Centrifuge until greyout. Surface electromyography (EMG) was recorded from the erector spinae, lateral abdominal, biceps femoris, vastus lateralis, and lateral gastrocnemius muscles of the subject's dominant side. The normalized root mean square (RMS) and mean power frequency (MPF) were calculated for each muscle at 1-second intervals throughout the exposure. The RMS amplitude for the muscles of the lower extremity showed a marked decrease (-61.45 percent) while muscles of the trunk exhibited a slight increase (+3.45 percent). The MPF of the EMG signal did not demonstrate a significant change during the exposure. Motor unit recruitment decreased in the lower extremity muscles during exposure. None of the studied muscles demonstrated a shift in the MPF suggesting evidence of fatigue. The results of the present study suggest the importance of maintaining a high level of muscle activity in the legs throughout exposure to sustained high levels of acceleration stress that require use of the AGSM. Author

N92-18981# Royal Netherlands Air Force, Soesterberg. Dept. of Aviation Medicine.

THE VALSALVA MANEUVER AND ITS LIMITED VALUE IN PREDICTING +GZ-TOLERANCE

E. J. VANLIESHOUT, J. J. VANLIESHOUT, J. KROL, M. SIMONS, and J. M. KAREMAKER (Amsterdam Univ., Netherlands). In AGARD, High Altitude and High Acceleration Protection for Military Aircrew 4 p Oct. 1991

Copyright Avail: NTIS HC/MF A12; Non-NATO Nationals requests available only from AGARD/Scientific Publications Executive

The aim of the present study was to investigate, in healthy subjects, if responses to a cardiovascular reflex test, the Valsalva maneuver (VM), might be predictive for +Gz-tolerance. The main finding is a significant correlation between blood pressure recovery during VM and peripheral light loss (relaxed, before executing the M1/L1-maneuver) ($r = 0.63$, p less than 0.05). All other parameters, including baroreflex sensitivity, did not significantly correlate with +Gz-tolerance. Furthermore intact baroreflex pathways were determined in all subjects. These results indicate that the parameters derived from the cardiovascular responses to VM may only confirm baroreflex integrity. Therefore VM might be used in the diagnostic process for fighter pilots with repeated +Gz-loss

of consciousness inflight who are suspected of an orthostatic disorder. However in a healthy subject VM has limited value in predicting +Gz-tolerance. Author

N92-18983# Air Force Systems Command, Brooks AFB, TX. Human Systems Div.

SUBJECTIVE REPORTS CONCERNING ASSISTED POSITIVE PRESSURE BREATHING UNDER HIGH SUSTAINED ACCELERATION

KATHY MCCLOSKEY, LLOYD D. TRIPP, DANIEL W. REPPERGER, and STEPHEN E. POPPER. In AGARD, High Altitude and High Acceleration Protection for Military Aircrew 6 p Oct. 1991

Copyright Avail: NTIS HC/MF A12; Non-NATO Nationals requests available only from AGARD/Scientific Publications Executive

Assisted positive pressure breathing, as found in the Combined Advanced Technology Enhanced Design G Ensemble (COMBAT EDGE) system, was shown to have distinct advantages and disadvantages concerning the subjective opinion of the system under sustained acceleration. Advantages include subjects' perceptions of the system as an advancement in G-protection technology, personal projections of increased tolerance to G-forces, decreases in fatigue due to a lessening of straining maneuver effort, and an increase in breathing ease during acceleration, at least for subjects with COMBAT EDGE experience. Disadvantages include an increased incidence of arm pain, breathing difficulties for subjects new to the system, and a tendency to rely too much on the system in lieu of traditional straining maneuvers. It is recommended that a training regimen be established to address these issues before the COMBAT EDGE system is deployed operationally. Author

N92-18984# Centre d'Etudes et de Recherches de Medecine Aerospatiale, Bretigny sur Orge (France). Div. de Biomecanique.

G-LOC. GZ AND BRAIN HYPOXIA. GZ/S AND INTRACRANIAL HYPERTENSION

P. QUANDIEU, D. GAFFIE, PH. LIEBAERT, M. BRIANE, J. C. SARRON (Direction des Recherches, Etudes et Techniques, Paris, France), A. GUILLAUME, D. TRAN, and J. PH. HAYMANN. In AGARD, High Altitude and High Acceleration Protection for Military Aircrew 15 p Oct. 1991. Sponsored in part by DRET G9

Copyright Avail: NTIS HC/MF A12; Non-NATO Nationals requests available only from AGARD/Scientific Publications Executive

The tilt of aircraft during a slow steep turn subjects the pilot to an acceleration which is colinear to the longitudinal axis of the body and can reach several times the acceleration of earth gravity. The purpose of this study is to propose a strictly biomechanic explanation of sudden inflight Loss Of Consciousness (LOC), i.e., brain nerve structures subject to Rapid Onset Rate (ROR) +Gz become functionally inefficient, not because of a shortage of oxygen, but because a sudden rise in brain mechanical stresses causes sudden intercranial hypertension. A simple model is proposed to analyze the following parameters: pressure distribution in the Cerebro-Spinal Fluid (CSF); distribution of stresses and deformations throughout the brain; and changes in blood flow pulsed into the skull. Calculations show the influence of a sudden change in flow rate causing collapses and supercritical flows sometimes followed by intravascular shocks. The first results of this modeling study indicate that ROR +Gz acceleration could augment mechanical stresses inside nerve tissues, and therefore result in sudden intracranial hypertension. Author

N92-18985# Laboratoire de Medecine Aerospatiale, Bretigny-sur-Orge (France). Centre d'Essais en Vol.

ASSISTED POSITIVE PRESSURE BREATHING: EFFECTS ON +GZ HUMAN TOLERANCE IN CENTRIFUGE

J. M. CLERE and J. W. BURNS (Air Force Systems Command, Brooks AFB, TX.) In AGARD, High Altitude and High Acceleration Protection for Military Aircrew 8 p Oct. 1991. In FRENCH and ENGLISH

Copyright Avail: NTIS HC/MF A12; Non-NATO Nationals requests available only from AGARD/Scientific Publications Executive

The goal of this paper is to present an experiment on the effect of Assisted Positive Pressure Breathing (APPB) as a method

of increasing G-time tolerance and improving very rapid onset rate (VROR) tolerance using APPB equipment. Six male volunteers were tested on a USAF centrifuge. The equipment used was a helmet with an occipital bladder for automatic mask tightening, mask, jerkin and G-suit, breathing regulator, and high flow G-valve. A standard ejection seat was used, positioned at 30 deg. Acceleration profiles were 9 +Gz for 10 sec at 1 G s(exp -1) or 4 G s(exp -1) and a 5-9 +Gz Simulated Aerial Combat Manoeuvre (SACM) profile at 4 G s(exp -1), with and without APPB. The anti-G straining maneuver (AGSM) was used as necessary to maintain adequate vision. APPB was a maximum of 9 kPa (68 mmHg) at 9 +Gz. Heart rate was calculated and heart rhythm anomalies were detected by an EKG. APPB had no significant effect on VROR tolerance or heart rate. APPB statistically increased G-time tolerance (167.9 +/- 38.4 s with APPB and 88.4 +/- 23.1 s without APPB (p less than 0.001)). Author

N92-18986# Royal Air Force Inst. of Aviation Medicine, Farnborough (England).

THE OPTIMISATION OF A POSITIVE PRESSURE BREATHING SYSTEM FOR ENHANCED G PROTECTION

A. R. J. PRIOR *In* AGARD, High Altitude and High Acceleration Protection for Military Aircrew 11 p Oct. 1991

Copyright Avail: NTIS HC/MF A12; Non-NATO Nationals requests available only from AGARD/Scientific Publications Executive

An electronic, computer controlled system was developed that allows full control of mask pressure and anti-G trouser inflation pressure in a pressure breathing anti-G system (PBG) installed on a human centrifuge. The apparatus was used to study the effect of different mask and trouser inflation pressures upon G protection in four subjects exposed to +Gz acceleration in the range 3 to 7 G while wearing full coverage anti-G trousers and a chest counter pressure waistcoat. Eye level arterial blood pressure was used as an objective measurement of G protection while subjective assessment of peripheral vision, anti-G trouser inflation pressure, mask pressure, and arm discomfort was measured using a ten centimeter line technique. The results show that eye level arterial blood pressure is better maintained as both mask and trouser inflation pressure are increased, however, peripheral vision was degraded to only 34 pct. of normal under any of the experimental circumstances. Subjectively, the preferred schedule of inflation for the anti-G trousers was 1.3 psi/G with a cut-in of about 2 Gz; for the PBG mask pressure it was 14 mmHg/G with a 3 Gz cut-in point. Arm pain occurred in all subjects and may be related to venous pressure. Author

N92-18987# Air Force Systems Command, Brooks AFB, TX. Crew Technology Div.

EFFECTS ON GZ ENDURANCE/TOLERANCE OF REDUCED PRESSURE SCHEDULES USING THE ADVANCED TECHNOLOGY ANTI-G SUITE (ATAGS)

L. J. MEEKER *In* AGARD, High Altitude and High Acceleration Protection for Military Aircrew 4 p Oct. 1991

Copyright Avail: NTIS HC/MF A12; Non-NATO Nationals requests available only from AGARD/Scientific Publications Executive

An advanced lower body full coverage anti-G suit was developed and is called the Advanced Technology Anti-G Suit (ATAGS). Previous centrifuge studies using standard pressurization schedules, flight tests, and theoretical considerations suggest that the ATAGS might provide equivalent G protection using reduced pressures. This study was conducted to determine the G protection afforded by ATAGS using a lower pressure schedule. Six test subjects were exposed to three separate G profiles during three test sessions. The profiles were: a gradual onset with the subject relaxed; a rapid onset to 9 G for 10 seconds with the subject performing an anti-G straining maneuver (AGSM); and a rapid onset 5 to 9 G Simulated Aerial Combat Manoeuvre (SACM) with 10 sec at each level, repeated to exhaustion. A different anti-G suit pressurization schedule was used at each test session. Data were analyzed by making statistical comparisons of performance between different pressure profiles, both for tolerance and endurance. Results suggest that the present standard of 10 to 8

psig at 9 G without reducing G protection, but that a pressure schedule resulting in 6 psig at 9 G is insufficient. Author

N92-18989# Drexel Univ., Philadelphia, PA. A CARDIOVASCULAR MODEL OF G-STRESS EFFECTS: PRELIMINARY STUDIES WITH POSITIVE PRESSURE BREATHING

DOV JARON, THOMAS W. MOORE, and PIERRE VIEYRES *In* AGARD, High Altitude and High Acceleration Protection for Military Aircrew 7 p Oct. 1991

Copyright Avail: NTIS HC/MF A12; Non-NATO Nationals requests available only from AGARD/Scientific Publications Executive

To study possible means of ameliorating the effects of gravitational acceleration on the cardiovascular system, a nonlinear digital computer model was developed. It combines a variable compliance model of the left ventricle, multielement models of the aorta and the systemic and venous systems, and lumped models of peripheral vascular beds. The vascular elements are obtained from the solution of the Navier-Stokes equations, combined with a set of simplifying assumptions. This closed loop system includes heart rate control and venous tone control, and the effects of acceleration forces. The model also can simulate the effect of several modes of G protection, including the anti-G suit, straining maneuvers, positive pressure breathing (PPB), and seat back angle. In this study, this model was used to gain an understanding of the effects of positive pressure breathing on G tolerance and to compare these effects to other protection methods. Author

N92-18990# Biodynamics International, Halifax (Nova Scotia). ASSESSMENT OF PHYSIOLOGICAL REQUIREMENTS FOR PROTECTION OF THE HUMAN CARDIOVASCULAR SYSTEM AGAINST HIGH SUSTAINED GRAVITATIONAL STRESSES

RICHARD COLLINS and EMILIA MATEEVA *In* AGARD, High Altitude and High Acceleration Protection for Military Aircrew 12 p Oct. 1991

Copyright Avail: NTIS HC/MF A12; Non-NATO Nationals requests available only from AGARD/Scientific Publications Executive

Satisfactory performance of combat pilots exposed to rapid onset of high sustained gravitational stress (+G) is compromised by caudalward fluid shifts which provoke 'compensatory' responses from the central nervous system. Such neural, metabolic, and humoral responses can lead to dramatic alterations in the heart rate, stroke volume, cardiac output, myocardial contractility, and vascular tonus, with the clear danger of loss of vision, loss of consciousness, and myocardial fibrillation and ischemia. A simple but complete model of the coronary circulation is proposed as a framework for organizing a systematic research program for the passive and active control of this circulation under conditions of extreme g-stress. Within such a framework, preliminary conclusions can be drawn concerning the study of effective countermeasures designed to enhance pilot tolerance in air-combat maneuvers. Author

N92-18991# Office National d'Etudes et de Recherches Aeronautiques, Paris (France). Direction de l'Energetique.

CIRCULATORY BIOMECHANICS EFFECTS OF ACCELERATIONS

D. GAFFIE, P. QUANDIEU, PH. LIEBAERT, D. COHEN-ZARDY, T. DAUMAS, and A. GUILLAUME (Centre d'Etudes et de Recherches de Medecine Aeronautique, Bretigny sur Orge, France) *In* AGARD, High Altitude and High Acceleration Protection for Military Aircrew 15 p Oct. 1991 Original language document was announced in IAA as A91-45645 Sponsored in part by DRET

Copyright Avail: NTIS HC/MF A12; Non-NATO Nationals requests available only from AGARD/Scientific Publications Executive

A general physical model of blood flow behavior in vessels is proposed, to have a better understanding of mechanisms which cause inflight loss of consciousness (LOC) in fighter pilots. The problem in the situation when heart work and external disturbances induced by aircraft motions are concomitant. Disturbances are both volume and surface changes. Calculations show that under certain

conditions blood flow is limited to a change in flow rate. It can then be hypothesized that under the effect of a sudden load, LOC could be caused by a factor other than brain hypoxia resulting from blood pooling in the pilot's lower limbs. Author

N92-18992# Victoria Univ. (British Columbia). Dept. of Mechanical Engineering.

FINITE ELEMENT MODELING OF SUSTAINED +GZ ACCELERATION INDUCED STRESSES IN THE HUMAN VENTRICLE MYOCARDIUM

J. MOORE, B. TABARROK, and W. FRASER (Defence and Civil Inst. of Environmental Medicine, Downsview, Ontario) In AGARD, High Altitude and High Acceleration Protection for Military Aircrew 7 p Oct. 1991

Copyright Avail: NTIS HC/MF A12; Non-NATO Nationals requests available only from AGARD/Scientific Publications Executive

Due to reports of endocardial hemorrhaging and myofibrillar degradation in swines undergoing high sustained +Gz accelerations, questions arise as to the possibility of cardiac tissue damage in humans subjected to similar Gz forces. Noninvasive cardiologic techniques used during experiments seem too insensitive to provide data to determine the presence of any localized cardiac damage. In addition, these tests involve some risk to the subject. Hence, there exists the need for a model to predict possible tissue damage under high sustained +Gz accelerations. The development is presented of such a model for the analysis of +Gz induced stresses in the human ventricle myocardium. The model is based on the finite element method where the effects of finite displacements, large strains and nonlinear nearly incompressible materials behavior are accounted for. When experiments cannot be justified, the computational model can provide valuable quantitative (gross distortions and predicted stresses) data on the effects of +Gz induced stresses in humans. Ultimately, the goal is to provide some form of cardiac risk assessment for pilots of high performance aircraft. Author

N92-19031# City Univ. of New York, NY.

THERMAL RESPONSES DURING EXTENDED WATER IMMERSION: COMPARISONS OF REST AND EXERCISE, AND LEVELS OF IMMERSION Final Report

MICHAEL M. TONER and WILLIAM D. MCARDLE 10 Nov. 1991 47 p

(Contract DAMD17-88-C-8013; DA PROJ. 3E1-62787-A-879) (AD-A244305) Avail: NTIS HC/MF A03 CSCL 06/4

Phase 1 exposed 14 subjects to the neck in 3 water temperatures during both rest (R) and exercise (E) conditions for up to 3 h; whereas 8 subjects in Phase 2 were exposed to the knee (KN), hip (HI), and chest (CH) in water at 15 and 25 C during R and E. In Phase 1 the pct. Body Fat was 9.5 for the low-fat (L, N=5), 14.8 for the moderate-fat (A, N=5), and 19.6 for the high-fat (H, N=4); subjects were immersed on four occasions (two temperatures X two activities) for durations up to 3 h. During R at equivalent thermal strain, rectal and esophageal temperatures declined similarly in all groups over 3 h. GRA

N92-19087# Maryland Univ., Baltimore. Dept. of Pharmacology and Toxicology.

REGULATION OF BRAIN MUSCARINIC RECEPTORS BY PROTEIN KINASE C Final Report, May 1988 - Jun. 1991

ESAM E. EL-FAKAHANY 21 Jun. 1991 9 p

(Contract DAAL03-88-K-0078)

(AD-A244419; ARO-25468.1-LS) Avail: NTIS HC/MF A02 CSCL 06/5

We investigated the pharmacological classification of the subtypes of muscarinic receptors which are coupled to increased hydrolysis of phosphoinositides in rat cerebral cortex. Our results indicated that both M1 and M3 receptors mediate such a response. This response to muscarinic receptor stimulation is partially blocked by tetrodotoxin or by protein kinase C activators. The component of the response that is sensitive to blockade by such agents does not correspond to a certain receptor subtype. We investigated the role of protein kinase C in desensitization of muscarinic receptor function in a neuronal clone. While this kinase was clearly involved

in the effects of phorbol esters, it did not play a role in agonist-induced receptor desensitization. We also studied some of the molecular events which accompany muscarinic receptor desensitization and down-regulation. These studies indicated that prolonged in vivo treatment of rats with an irreversible acetylcholinesterase decreased the concentration of the mRNA encoding the M2 muscarinic receptor. GRA

N92-19255# Laboratoire de Medecine Aerospatiale, Bretigny-sur-Orge (France).

MEASUREMENT OF SIGHT DIRECTION IN A CENTRIFUGE. PART 2: EYE MOVEMENT (MESURE DE LA DIRECTION DU REGARD EN CENTRIFUGEUSE. DEUXIEME PARTIE: MOUVEMENT DE L'OEIL)

C. A. LEGER, G. DEBENQUE, C. DESGRANGES, L. GIRARDEAU, and L. DIZARNY-GARGAS Dec. 1990 77 p In FRENCH (Contract DRET-88-1035)

(REPT-1169/CEV/SE/LAMAS; ETN-92-90864) Avail: NTIS HC/MF A05

A helmet mounted system is used to measure eye movements and other visual ergonomic factors during centrifuge tests. The purpose of the system is to determine the resolution, reproducibility, and precision possible with such a system, and identify possible sources of error in such a system. Technical difficulties involved in developing the helmet mounted system were initially underestimated. A more universal solution to the problem of ocular illumination is suggested. The drawbacks of existing software for real time analysis are summarized. ESA

N92-19273# Executive Office of the President, Washington, DC. Committee on Interagency Radiation Research and Policy Coordination.

IONIZING RADIATION RISK ASSESSMENT, BEIR 4

Oct. 1991 31 p

(Contract DE-AC05-76OR-00033)

(DE92-004014; ORAU-91/J-20; CIRRPC-8) Avail: NTIS HC/MF A03

This report of the Subpanel discusses the potential impact on Federal agencies and indicates individual risk factors that could be used by them in risk assessment. The approach used in this CIRRPC report was to consider the risk factors presented in BEIR IV for each radionuclide (or group radioelements) and to make some judgments regarding their validity and/or the uncertainties involved. The coverage of Radon-222 and its progeny dominated the BEIR IV report and this Subpanel felt it was proper to devote more attention to this radionuclide family. This risk factor presented in BEIR IV for radon is 350 cancer deaths per million person-working level months (WLM) of exposure for a lifetime. There is a range of opinions on the conversion from WLM to absorbed dose. As discussed in the text, the use of the WLM concept makes it difficult or infeasible to compare the risk factor for radon with that of other radionuclides which are based on organ dose. This report also includes a discussion of certain fundamental scientific and operational issues that may have decisive effect upon risk factor selection. These adjunct items are dealt with under separate headings and include discussions of threshold dose considerations, extrapolation to low doses, and age at exposure. DOE

N92-19333# Defence Research Establishment, Ottawa (Ontario).

INVESTIGATION OF THE EFFECT OF COOLING THE FEET AS A MEANS OF REDUCING THERMAL STRESS

SYDNEY D. LIVINGSTONE and RICHARD W. NOLAN Aug. 1991 14 p

(AD-A244264; DREO-TN-91-15) Avail: NTIS HC/MF A03 CSCL 06/4

The purpose of this investigation was to determine if cooling the feet is as effective as cooling the hands in the alleviation of heat stress. Each of six volunteers dressed in chemical warfare (CW) protective clothing, sat for 120 min in an environment of 35 C and then immersed his feet in a water calorimeter for 20 min. Heat lost to the calorimeter was measured at water temperatures of 10, 15, 20, 25 and 30 C. The use of water-cooled socks was

also examined under these environmental conditions. It was found that heat loss from the feet was comparable to that from the hands indicating that the two methods are equally efficient. Preliminary results indicate that the use of water-cooled socks may also be practical. GRA

N92-19347# Laboratoire de Medecine Aerospatiale, Bretigny-sur-Orge (France).

MEASUREMENT OF SIGHT DIRECTION IN A CENTRIFUGE. PART 1: HEAD MOVEMENT [MESURE DE LA DIRECTION DU REGARD EN CENTRIFUGEUSE. PREMIERE PARTIE: MOUVEMENT DE LA TETE]

G. DEBENQUE, C. DESGRANGES, L. GIRARDEAU, and A. LEGER Dec. 1990 40 p In FRENCH
(Contract DRET-88-1035)
(REPT-1168/CEV/SE/LAMAS; ETN-92-90865) Avail: NTIS HC/MF A03

The precision of global measurements obtained using an electro-optic helmet mounted aiming system is evaluated. Possible sources of error are determined. The influence of various factors on these sources is outlined. The precision of measurements is evaluated in terms of the efficiency of parallel error correction, reproducibility, and global precision of corrected measurements. Errors of less than one-half of a degree are found in most cases. The global precision, measured by means of one sensor, is better than 0.8 degrees for 95 percent of the measurements carried out. ESA

N92-19689# Veterans Administration Hospital, White River Junction, VT. National Center for Post-Traumatic Stress Disorder. **PILOTS: USER'S GUIDE**

FRED LERNER Oct. 1991 71 p
(PB92-100262) Avail: NTIS HC/MF A04 CSCL 06/16

The User's Guide is designed to assist librarians and other experienced database searchers in using the Published International Literature on Traumatic Stress (PILOTS) database and its online equivalent, the Post Traumatic Stress Disorder (PTSD) subfile of the Combined Health Information Database (CHID). It includes a field-by-field guide to searching the database on BRS or using Pro-Cite, as well as the PILOTS Thesaurus. GRA

N92-19702# Health Effects Research Lab., Research Triangle Park, NC.

EVALUATING THE HUMAN HEALTH EFFECTS OF HAZARDOUS WASTES: REPRODUCTION AND DEVELOPMENT, NEUROTOXICITY, GENETIC TOXICITY, AND CANCER

ROBERT S. DYER, VIRGINIA S. HOUK, and LAWRENCE W. REITER 1991 20 p
(PB92-110352; EPA/600/D-91/236) Avail: NTIS HC/MF A03 CSCL 06/16

Several approaches are available for characterizing potential toxicity of wastes. The paper describes biological tests which are appropriate for identifying waste as neurotoxic, genotoxic, or likely to produce developmental or reproductive effects. The tests recommended are as follows: for neurotoxicity a functional observational battery, coupled with a measure of motor (bodily movement) activity; for genetic toxicity, the 'Ames' test of mutagenicity in Salmonella and a test of clastogenicity (DNA damage); and for developmental and reproductive toxicity, the Chernoff-Kavlock assay and a multi-generational reproductive assay. In addition, the paper identifies several generic factors which must be considered in performing any evaluations of hazardous wastes. GRA

N92-19761*# Pennsylvania Univ., Philadelphia. Inst. for Environmental Medicine.

PATHOPHYSIOLOGY OF SPONTANEOUS VENOUS GAS EMBOLISM Final Report

C. J. LAMBERTSEN, K. H. ALBERTINE, J. B. PISARELLO, and N. D. FLORES 10 Nov. 1991 90 p

(Contract NAG9-154)

(NASA-CR-189915; NAS 1.26:189915) Avail: NTIS HC/MF A05 CSCL 06/16

The use of controllable degrees and durations of continuous isobaric counterdiffusion venous gas embolism to investigate effects of venous gas embolism upon blood, cardiovascular, and respiratory gas exchange function, as well as pathological effects upon the lung and its microcirculation is discussed. Use of N₂O/He counterdiffusion permitted performance of the pathophysiological and pulmonary microstructural effects at one ATA without hyperbaric or hypobaric exposures. Author

N92-19877# Pennsylvania Univ., Philadelphia. Dept. of Radiology.

EFFECT OF INCREASED AXIAL FIELD OF VIEW ON THE PERFORMANCE OF A VOLUME PET SCANNER

JOEL S. KARP, PAUL E. KINAHAN, GERD MUEHLEHNER, and PETER COUNTRYMAN 1991 9 p Presented at the IEEE Nuclear Science Symposium, Santa Fe, NM, 5-9 Nov. 1991
(Contract DE-FG02-88ER-60642)
(DE92-004424; CONF-911106-34) Avail: NTIS HC/MF A02

The performance of the PENN-PET 240H scanner from UGM Medical Systems is tested and compared to the prototype PENN-PET scanner built at the University of Pennsylvania. The UGM PENN-PET scanner consists of six continuous position-sensitive NaI(Tl) detectors, which results in a 50-cm transverse field-of-view and a 12.8-cm axial field-of-view. The fine spatial sampling in the axial direction allows the data to be sorted into as many as 64 transverse planes, each 2-mm thick. A large axial acceptance angle, without interplane septa, results in a high sensitivity, with a low scatter and random fraction, due to the use of a narrow photopeak energy window. This paper emphasizes those performance measurements that illustrate the special characteristics of a volume imaging scanner and how they change as the axial length is increased. DOE

N92-19952# Pennsylvania State Univ., University Park. Dept. of Chemical Engineering.

NONINVASIVE DETERMINATION OF RESPIRATORY OZONE ABSORPTION: DEVELOPMENT OF A FAST-RESPONDING OZONE ANALYZER Research Report, Jun. 1988 - Apr. 1990

J. S. ULTMAN and A. BEN-JEBRIA 1991 35 p Sponsored in part by Health Effects Inst., Cambridge, MA
(PB91-243220; HEI/RR-91/39) Copyright Avail: NTIS HC/MF A03 CSCL 06/16

An ozone analyzer and an ozone bolus generator were developed and tested for future use in noninvasive measurements of ozone absorption along human respiratory tract using the bolus-response technique. The analyzer, based on the chemiluminescent reaction of ozone with 2-methyl-2-butene, is sufficiently rapid and sensitive to measure changes in ozone concentration during a 4 second breathing period at quiet respiratory flow rates of 300 mL/sec in humans. Its performance characteristics include a 90 pct. step response time of 110 msec, a linear calibration from 0.03 to 10 ppm ozone, a signal to noise ratio of 30 at 0.5 ppm ozone, and a minimum detection limit of 0.017 ppm ozone. The ozone bolus generator can produce single boluses containing as little as 0.35 micro g ozone in a volume of 19 mL, with a peak ozone fraction of up to 4 ppm. The analyzer and bolus generator were tested in bolus-response experiments at steady air flow rates of 50 to 200 mL/sec in excised pig and sheep tracheas. Twenty-five to 50 pct. of the ozone introduced into the trachea was absorbed. Analysis of the mathematical moments of the bolus input and response curves and comparison to predictions of a diffusion theory indicate that ozone absorption is limited by diffusion processes in the airway lumen. Author

N92-19954# State Univ. of New York, Buffalo. Dept. of Mechanical and Aerospace Engineering.

RETENTION MODELING OF DIESEL EXHAUST PARTICLES IN RATS AND HUMANS Research Report, Apr. 1987 - Apr. 1990

C. P. YU and K. J. YOON 1991 41 p Sponsored in part by

Health Effects Inst., Cambridge, MA
(PB91-243238; HEI/RR-91/40) Copyright Avail: NTIS HC/MF
A03 CSCL 06/16

To study lung clearance, a compartmental model was used consisting of the nasopharyngeal, tracheobronchial, alveolar, and lung associated lymph node compartment. A particle model was assumed made up of material components according to the characteristics of clearance: (1) a carbonaceous core or soot (80 pct. of particle mass); (2) slowly cleared organics (10 pct. pm); and (3) fast cleared organics (10 pct. pm). Kinetic equations of the retention model were first developed for rats. The lung burden calculations showed that although the organics were cleared at nearly constant rates, the alveolar clearance rate of soot decreased with increasing lung burden. At low lung burdens, the alveolar clearance rate was controlled by macrophage migration to the mucociliary escalator, whereas at high lung burdens, the clearance rate was determined by transport to the lymphatics. The retention model for rats was extrapolated to humans of different ages. The reduction in the mechanical clearance in adult humans caused by exposure to high concentrations of diesel exhaust was much less than that observed in rats. The reduction in children was greater than in adults.

Author

N92-19956# North Carolina Univ., Chapel Hill.

EFFECTS OF 4 PERCENT AND 6 PERCENT CARBOXYHEMOGLOBIN ON ARRHYTHMIA PRODUCTION IN PATIENTS WITH CORONARY ARTERY DISEASE Research Report, Nov. 1985 - Nov. 1989

D. S. SHEPS, M. C. HERBST, A. L. HINDERLITER, K. F. ADAMS, and L. G. EKELUND 1990 66 p Prepared in cooperation with Environmental Protection Agency, Research Triangle Park, NC Sponsored in part by Health Effects Inst., Cambridge, MA (PB91-243246; HEI/RR-91/41) Copyright Avail: NTIS HC/MF
A04 CSCL 06/16

The effects were assessed of exposure to carbon monoxide (CO) resulting in 4 or 6 pct. carboxyhemoglobin (COHb) on ventricular arrhythmias in 41 subjects (nonsmokers) with documented coronary artery disease. Subjects were exposed to room air, 100 ppm CO (target, 4 pct. blood COHb), or 200 ppm CO (target, 6 pct. blood COHb), and then did a supine bicycle exercise test. Radionuclide ventriculography was performed at rest and during exercise. Ambulatory electrocardiogram recordings were made to determine the frequency of premature ventricular contractions (PVCs). The frequency of single and multiple PVCs per hour during exercise was significantly greater on the 6 pct. COHb day than on the room air day (for single PVCs, 167.72 ± 37.99 for 6 pct. COHb compared with 127.32 ± 28.22 for room air, $p = 0.03$; for multiple PVCs, 9.59 ± 3.70 for 6 pct. COHb day compared with 3.18 ± 1.67 for the room air day, $p = 0.02$). Patients who developed increased arrhythmias were significantly older than those who had a higher peak workload during. No effects of CO exposure was seen on the 6 pct. COHb day for subjects at rest, or on the 4 pct. COHb day.

Author

N92-19957# Midwest Research Inst., Golden, CO. Life Sciences Dept.

EFFECTS OF METHANOL VAPOR ON HUMAN NEUROBEHAVIORAL MEASURES Research Report, Jul. 1988 - Oct. 1990

M. R. COOK, F. J. BERGMAN, H. D. COHEN, M. M. GERKOVICH, and C. GRAHAM 1991 65 p Sponsored in part by Health Effects Inst., Cambridge, MA (PB91-243253; HEI/RR-91/42) Copyright Avail: NTIS HC/MF
A04 CSCL 06/16

Methanol may become an important alternative fuel for vehicles in the near future. The objective of the preliminary study was to determine if inhalation exposure to methanol, near the maximum concentration allowed for an eight hour average exposure in the workplace (200 ppm), would have adverse effects on human neurobehavioral functions. Twelve healthy young men were exposed twice to filtered air and twice to 192 ppm methanol vapors for 75 minutes on different days under double blind conditions. Twenty two neurobehavioral and neurophysiological tests were

administered before, during, and after exposure to measure visual, behavioral, reasoning, and hearing functions. Exposure to methanol produced significant increases in blood and urine methanol concentration at the end of the exposure period. As expected, no changes in plasma formate were observed. Methanol exposure had no effect on the subjects' performance on most of the tests. However, some methanol exposed subjects reported more fatigue and lack of concentration. Performance was also slightly impaired on the Sternberg memory task. These effects were small and did not exceed the range of results measured in filtered air exposed subjects.

Author

N92-19977*# National Aeronautics and Space Administration. Ames Research Center, Moffett Field, CA.

CREW FACTORS IN FLIGHT OPERATIONS. 8: FACTORS INFLUENCING SLEEP TIMING AND SUBJECTIVE SLEEP QUALITY IN COMMERCIAL LONG-HAUL FLIGHT CREWS

PHILIPPA H. GANDER, R. CURTIS GRAEBER, LINDA J. CONNELL, and KEVIN B. GREGORY (Sterling Software, Palo Alto, CA.) Dec. 1991 41 p (NASA-TM-103852; A-91106; NAS 1.15:103852) Avail: NTIS
HC/MF A03 CSCL 06/16

How flight crews organize their sleep during layovers on long-haul trips is documented. Additionally, environmental and physiological constraints on sleep are examined. In the trips studied, duty periods averaging 10.3 hr alternated with layovers averaging 24.8 hr, which typically included two subject-defined sleep episodes. The circadian system had a greater influence on the timing and duration of first-sleeps than second-sleeps. There was also a preference for sleeping during the local night. The time of falling asleep for second-sleeps was related primarily to the amount of sleep already obtained in the layover, and their duration depended on the amount of time remaining in the layover. For both first- and second-sleeps, sleep durations were longer when subjects fell asleep earlier with respect to the minimum of the circadian temperature cycle. Naps reported during layovers and on the flight deck may be a useful strategy for reducing cumulative sleep loss. The circadian system was not able to synchronize with the rapid series of time-zone shifts. The sleep/wake cycle was forced to adopt a period different from that of the circadian system. Flight and duty time regulations are a means of ensuring that reasonable minimum rest periods are provided. This study clearly documents that there are physiologically and environmentally determined preferred sleep times within a layover. The actual time available for sleep is thus less than the scheduled rest period.

Author

N92-20020# National Inst. for Occupational Safety and Health, Cincinnati, OH.

DEVELOPMENT OF A LUNG-CELL MODEL FOR STUDYING WORKPLACE GENOTOXICANTS Final Report

W. Z. WHONG 1991 25 p (PB92-114644) Avail: NTIS HC/MF A03 CSCL 06/16

The objectives were to establish in-vivo and/or in-vitro multiple genetic endpoint assay systems using lung cells of the rat, to compare the sensitivity of rat lung cells to genotoxins between in-vivo and in-vitro assay systems, and to evaluate the suitability of the multiple genetic endpoint/lung cell assay system for detecting genotoxicity. Male CD-rats were used. Results indicated that the best enzymatic separation of rat lung cells was a combined treatment of lung with trypsin and collagenase or a cold digestion with protease. Two micrograms cytochalasin-B/mm for two days incubation was the optimal protocol for cytokinesis block in lung cells during micronucleus formation (MN) assay. Primary lung cells can be used for in-vivo and in-vitro sister chromatid exchange and MN analyses. A minimal 16 hour cell incubation in the presence of tritium labeled thymidine was required for visualization of optimal DNA repair in the lung cells/unscheduled DNA synthesis (UDS) assay system. Both alveolar macrophages and primary lung cells could be used for in-vivo and in-vitro UDS assays.

Author

BEHAVIORAL SCIENCES

Includes psychological factors; individual and group behavior; crew training and evaluation; and psychiatric research.

A92-26005

INVESTIGATION OF MENTAL WORK CAPACITY OF COSMONAUTS ABOARD THE MIR ORBITAL COMPLEX [ISSLEDOVANIIE PSIKHICHESKOI RABOTOSPOSOBNOSTI KOSMONAVTOV NA ORBITAL'NOM KOMPLEKSE 'MIR']

K. K. IOSELIANI, A. L. NARINSKAIA, SH. R. KHISAMBEEV, and G. RADKOVSKI. Kosmicheskaia Biologiia i Aviakosmicheskaia Meditsina (ISSN 0321-5044), vol. 25, Nov.-Dec. 1991, p. 8-11. In Russian. refs
Copyright

In the framework of the Prognoz experiment, changes in the mental performance occurring after 3 to 5 days of stay aboard Mir and 190 days after the mission, were evaluated in four cosmonauts visiting the station, using a computer-based psychodiagnostic unit Pleven-87. Mental performance was estimated from the ability of the subject to quickly solve the following problems: continuous counting in optimal, prescribed, or self-regulated rhythm; a complex sensorimotor reaction having psychological feedback; a conditional motor reaction to several combinations of color stimuli; and a reaction to a moving object. Results demonstrated the ability of the Pleven-87 system to provide reliable predictions concerning the mental work capacity of cosmonauts. All subjects demonstrated high mental stability during and after the flight. I.S.

A92-26330

THE EFFECT OF SLEEP DEPRIVATION AND SUSTAINED MILITARY OPERATIONS ON NEAR VISUAL PERFORMANCE

JULIE R. QUANT (Hong Kong Polytechnic, Kowloon) Aviation, Space, and Environmental Medicine (ISSN 0095-6562), vol. 63, March 1992, p. 172-176. Research supported by Ministry of Defence of England. refs
Copyright

A group of military servicemen were deprived of sleep for 65 h while they carried out a simulated military mission with a high visual workload. Their performance in a series of near vision tests was monitored. In general, the visual system was found to be resilient to the stress of sleep loss, the subjects experiencing mild symptoms of asthenopia (eyestrain). However, after 48 h without sleep there was a reduction in amplitude of convergent fusional reserves and a decrease in contrast sensitivity to a spatial frequency of 6 cycles/deg. A disruption in diurnal rhythms for these parameters was suggested. The results are considered in terms of the maintenance of visual efficiency and comfort with loss of sleep, and have implications for both the military and civilians involved in shift work and long work schedules. Author

N92-18245# North Carolina Univ., Chapel Hill. Dept. of Computer Science.

AUTOMATED PROTOCOL ANALYSIS: TOOLS AND METHODOLOGY

JOHN B. SMITH, DANA K. SMITH, and EILEEN KUPSTAS Aug. 1991 28 p
(Contract N00014-86-K-0680; NSF IRI-85-19517; NSF IRI-88-17305)
(AD-A242040; TR91-034) Avail: NTIS HC/MF A03 CSCL 23/2

The TextLab Research Group, over the past seven years, has developed a collection of tools and techniques for recording users' interactions with computer systems in machine-readable form and for automatically analyzing and displaying those data. This report catalogs those tools and discusses their methodological context and implications. Tools discussed include the following: tracking users behaviors and producing a machine recorded protocol at the level of action - data an order of magnitude larger

than keystrokes; replaying users' sessions from protocol data; modeling users' strategies using formal cognitive grammars; analyzing user sessions by parsing them with the grammars; and displaying results in visual form, both static and animated, to facilitate interpretation and understanding by researchers. These tools are placed in a methodological context by reviewing issues associated with concurrent think-aloud, keystroke, and video protocols; and other computer systems are reviewed that support these forms of protocol data. The discussion concludes by noting the increased importance of data management required by automated methods and our thoughts for a comprehensive environment, built around a protocol management facility, that would integrate the tools discussed and support development of new ones. GRA

N92-19064# Health Research, Inc., Albany, NY.

ACTIVITY-DRIVEN CNS CHANGES IN LEARNING AND DEVELOPMENT Final Report, 15 Apr. 1990 - 14 Apr. 1991

JONATHAN R. WOLPAW 14 Apr. 1991 413 p
(Contract AF-AFOSR-0238-90; AF PROJ. 2312)
(AD-A243790; AFOSR-91-0937TR) Avail: NTIS HC/MF A18 CSCL 05/8

The conference that formed the basis for the present volume took place in May, 1990 at the Rensselaerville Institute in Rensselaerville, New York near Albany. This last meeting reflected the increased pace and breadth of recent research. Most important, it added a new theme to the two stressed before: Its central goal was to discuss, in a connected fashion, the entire sequence of events underlying learning and development. Such a comprehensive and logical format has only become possible in the last few years. Before that, knowledge was too fragmentary to permit meaningful adherence to this framework. At the same time, recent advances have made it imperative to encourage interactions between scientists working at each level in this sequence, if understanding of learning and development is not to remain disjointed and compartmentalized. To emphasize this theme, the meeting's organization paralleled the progression from neuronal activity to altered behavior. Thus, the first session described receptormediated triggers of plasticity, the second discussed accompanying molecular events, the next two evaluated synaptic modifications resulting from these events, and the last two evaluated expression of these synaptic modifications as altered behavior of neural networks and whole animals. GRA

N92-19069# New York Univ., New York. Neuromagnetism Lab. **ATTENTION, IMAGERY AND MEMORY: A NEUROMAGNETIC INVESTIGATION Final Report, 1 Mar. 1988 - 30 Sep. 1991**

LLOYD KAUFMAN and SAMUEL J. WILLIAMSON 14 Oct. 1991 123 p
(Contract F49620-88-K-0004)
(AD-A243859; AFOSR-91-0970TR) Avail: NTIS HC/MF A06 CSCL 05/8

The techniques of magnetic source imaging (MSI) have been applied to studies of three important aspects of human cognition: (1) An investigation of the effects of selective spatial attention on information processing within the human visual cortex for stimuli of constant luminance have revealed that early response components from 120 to 180 ms latency provide evidence for such effects, but amplitude enhancements for later components are probably related to pattern recognition and task-relevant stimulus discrimination; (2) A study of the relationship between the performance of a cognitive task such as visual imagery, or silent rhyming, and the suppression of spontaneous cortical rhythms reveals that the location, onset time, and duration of suppression are task specific and correlate with measures of performance; and (3) The characterization of the functional attributes of neuronal activity in human auditory association cortex provides evidence that cortical activation traces in primary and association areas can be accurately characterized by distinct lifetimes, which typically amount to several seconds, and that these sensor memories characterize specific physical attributes of sound. GRA

N92-19083# Wisconsin Univ., Madison. Dept. of Computer Sciences.

BEHAVIOR AND LEARNING IN NETWORKS WITH DIFFERING AMOUNTS OF STRUCTURE Final Report, 1 Dec. 1988 - 30 Nov. 1990

LEONARD UHR 9 Sep. 1991 28 p
(Contract AF-AFOSR-0178-89; AF PROJ. 2305)
(AD-A244080; UW-144-AS50; AFOSR-91-0939TR) Avail: NTIS HC/MF A03 CSCL 05/8

This research is investigating how well large networks that are built from neuron-like elements can be made to perform and learn to perform by giving them different types and amounts of built in structure and the ability to learn by generating new nodes in additions to changing weights. Substantial improvements in both learning speed and performance have been achieved on both pattern recognition problems and a range of problems typically used to demonstrate the power of connectionist networks. In addition, a number of new microcircuits and subnetworks have been specified with which more powerful and more flexible networks can be built. These include: back-cycling nets that handle learning (along with many useful functions), rather than having learning handled by the system that executes the net; nets that handle symbols as well as numbers; and microcircuits for productions and perceptual transforms. GRA

N92-19364# Mei Associates, Inc., San Antonio, TX.
CHARACTERIZATION OF AIR FORCE TRAINING AND COMPUTER-BASED TRAINING SYSTEMS Final Report, Mar. 1990 - Jul. 1991

WILLIAM J. WALSH, PATRICIA J. YEE, and STEVEN A. YOUNG
Dec. 1991 237 p
(Contract F33615-88-C-0003)
(AD-A243781; AL-TP-1991-0048) Avail: NTIS HC/MF A11 CSCL 06/5

This paper documents the approach used in the development of guidelines designed to aid novice training managers in the computer-based training (CBT) system planning, selection and implementation process. Phase 1 developed a list of critical factors that characterized Air Force training organizations and CBT technologies. These factors were developed at a level simple enough so misinterpretation by novice managers was minimized. Next, decision processes were merged with identified factors forming guidelines that followed an input-process-output model. These preliminary guidelines were field-tested during Phase 2 at four Air Force training organizations. Concurrent with field-testing, the guidelines were validated by convening a panel of Air Force CBT 'experts' to critique the guidelines and compare their CBT development processes with those of the guidelines. Following these efforts, the guidelines were revised and refined. GRA

N92-19365# Case Western Reserve Univ., Cleveland, OH. Dept. of Psychology.

RESPONSE DEVICES AND COGNITIVE TASKS Annual Report, 16 Jun. 1990 - 30 Oct. 1991

DOUGLAS K. DETTERMAN 30 Oct. 1991 6 p
(Contract AF-AFOSR-0084-90; AF PROJ. 2313)
(AD-A243903; AFOSR-91-0984TR) Avail: NTIS HC/MF A02 CSCL 05/8

The aims of the research are to study the effects of response mode, response complexity, instructions and practice on basic cognitive tasks, and to use the information obtained to develop more elaborated models of cognitive functioning which take these factors into account. To accomplish these aims, subjects will be tested on a set of computer-administered cognitive tasks, using keyboard and touch screen response modes, and under varying sets of verbal and nonverbal instructions. GRA

N92-19410# Deutsche Forschungsanstalt fuer Luft- und Raumfahrt, Hamburg (Germany, F.R.). Abt. Luft- und Raumfahrtpsychologie.

THE CONSTRUCTION OF PERSONALITY QUESTIONNAIRES FOR SELECTION OF AVIATION PERSONNEL

KLAUS-MARTIN GOETERS and BERND TIMMERMANN Mar.

1991 42 p

(DLR-FB-91-18; ISSN-0939-2963; ETN-92-90735) Avail: NTIS HC/MF A03; DLR, Wissenschaftliches Berichtswesen, VB-PL-DO, Postfach 90 60 58, 5000 Cologne, Fed. Republic of Germany, HC 16 DM

The Personality Research Form (PRF), a questionnaire for voluntary self description, was administered to a group of 300 applicants for pilot training at a major European airline. Standard psychometric statistics were computed for the PRF subscales. The comparison with information given in the test manual shows that the reliabilities of all PRF subscales decline in personnel selection. Strong ceiling effects which were caused by response sets (mainly social desirability) are identified as the reason for this phenomenon. Besides the PRF the Temperament Structure Scales (TSS) were presented to the same group. The TSS is a questionnaire which is constructed for selection conditions. The computed factor analytic results indicate that its factor structure is very similar to that of the PRF. No detrimental downward trend could be revealed for the scale reliabilities of the TSS. Thus, it seems possible to construct questionnaires which are robust with respect to selection conditions. ESA

N92-19799# Wake Forest Univ., Winston-Salem, NC. Dept. of Physiology and Pharmacology.

RECEPTOR SUBTYPE ALTERATIONS: BASES OF NEURONAL PLASTICITY AND LEARNING Final Technical Report

BRENT A. VOGT 3 Dec. 1991 12 p
(Contract AF-AFOSR-0372-90; AF PROJ. 2312)
(AD-A244406; AFOSR-91-1028TR) Avail: NTIS HC/MF A03 CSCL 05/8

The following findings were reported: (1) oxotremorine-m binding in rabbit thalamus and cingulate cortex increased during discriminative avoidance conditioning (DAC); (2) excitatory and discriminative neuronal activity was documented throughout DAC and there were relationships between training-induced neuronal activity and changes in binding; (3) turnover of noradrenaline was significantly elevated during DAC suggesting a role for this transmitter in long-term memory; (4) anterior cingulate cortex lesions uncover discriminative neuronal activity in the striatum and amplify activity in thalamus; (5) the structure connections and spontaneous activity of the lateral magnocellular nucleus in thalamus were described; and (6) a review was written of the structure and function of cortical layer I and its role in learning and memory analyzed. These are the first studies to document physiological regulation of receptors and transmitters that occur during avoidance learning and provide the basis for a comprehensive analysis of the molecular bases for learning and memory. GRA

N92-20037# Advisory Group for Aerospace Research and Development, Neuilly-Sur-Seine (France). Aerospace Medical Panel.

HUMAN PERFORMANCE ASSESSMENT METHODS

May 1989 73 p
(AGARD-AG-308; ISBN-92-835-0510-7) Copyright Avail: NTIS HC/MF A04; Non-NATO Nationals requests available only from AGARD/Scientific Publications Executive

The goal was to develop the 'Standardized Tests for Research on Environmental Stressors' or 'STRES' Battery, satisfying conventional psychometric criteria such as reliability, validity, and sensitivity for which an extensive data base may now be compiled among the NATO nations. The protocol for the 7 selected tests is presented. Author

MAN/SYSTEM TECHNOLOGY AND LIFE SUPPORT

Includes human engineering; biotechnology; and space suits and protective clothing.

A92-25269

AN EXPERIMENTAL STUDY OF THE EFFECT OF HIGH PRESSURE ON THE ADSORPTION PROPERTIES OF SILOCHROME C-120 [EKSPERIMENTAL'NOE IZUCHENIE VLIANIYA POVYSHENNOGO DAVLENIIA NA ADSORBTSIONNYE SVOISTVA SILOKHROMA C-120]

O. A. SUKHORUKOV, M. V. AZAROVA, and V. P. BOROVIKOVA Kosmicheskaya Biologiya i Aviakosmicheskaya Meditsina (ISSN 0321-5044), vol. 25, Sept.-Oct. 1991, p. 50, 51. In Russian. refs Copyright

The effect of atmospheric pressure on the adsorption capacity of silochrome C-120 with respect to various toxic gases (including heptane, octane, nonane, benzene, toluene, and m-xylene vapors) was investigated in a helium atmosphere from 7 to 77 gage atm. It was found that the adsorption capacity of C-120 decreased with pressure for all the substances investigated (except toluene which showed a small and transient increase in adsorption at 10 gage atm, followed by a sharp fall at 18.5 gage atm). I.S.

A92-25273

A METHOD FOR DETERMINING LEVELS OF CALCIUM IN THE HAND USING ACTIVATED NEUTRONS FROM (PU-238)-BE SOURCES [SPOSOB OPREDELENIYA UROVNYA KAL'TSIYA V KISTI RUKI PUTEM AKTIVATSII NEITRONAMI OT PU-238-BE-ISTOCHNIKOV]

V. E. ZAICHIK, A. P. DUBROVIN, A. M. KORELO, and B. V. MORUKOV Kosmicheskaya Biologiya i Aviakosmicheskaya Meditsina (ISSN 0321-5044), vol. 25, Sept.-Oct. 1991, p. 58-61. In Russian. refs Copyright

The method of neutron-activation analysis (NAA) described by Zherbin and Zaichik (1976), Zaichik et al. (1980, 1986), and Zaichik (1987) was applied in vivo for determining calcium levels in the tissues of the hand. The instrumental setup for the experiment is described together with the details of the procedure and the results of an experiment. The high accuracy of the results obtained with the procedure, together with the relatively low levels of exposure and the simplicity of the instrumental setup, recommend this method for applications to both space studies and clinical tests of calcium depletion. I.S.

A92-26007

A MODEL OF THE PILOT'S PERCEPTION OF THE PERTURBED ANGULAR MOTION OF THE COCKPIT AS PART OF THE PILOT'S INFORMATION MODEL [MODEL' VOSPRIYATIYA PILOTA VOZMUSHCHENNOGO UGLOVOGO DVIZHENIYA KABINY KAK CHAST' EGO INFORMATSIONNOI MODEL']

V. N. AZARSKOV, L. N. BLOKHIN, V. V. BURDIN, and L. I. VORONIN Kosmicheskaya Biologiya i Aviakosmicheskaya Meditsina (ISSN 0321-5044), vol. 25, Nov.-Dec. 1991, p. 14-17. In Russian. refs

Copyright

The paper presents an algorithm of structural identification of a dynamic system, as a model of the pilot's perception of the perturbed angular motion of the cockpit and the motion's transmission to the joystick. Assessments of scalar quasi-linear and multichannel models of pilot's functions are given. Results obtained illustrate the potential of this procedure. I.S.

A92-26008

MICROBIOLOGICAL ASPECTS OF THE ENVIRONMENT OF UNDERWATER HABITATS [MIKROBIOLOGICHESKIE ASPEKTY OBITAEMOSTI GLUBOKOVODNYKH BAROKOMPLEKSOV]

A. N. VIKTOROV, V. K. IL'IN, N. A. POLIKARPOV, M. P. BRAGINA, V. G. SOBOLEVSKII, A. B. SYSOEV, and T. I. NORKINA Kosmicheskaya Biologiya i Aviakosmicheskaya Meditsina (ISSN 0321-5044), vol. 25, Nov.-Dec. 1991, p. 17-21. In Russian. refs Copyright

The effect of the hyperbaric environment on the counts of a gram-negative organism, *Pseudomonas aeruginosa*, in the mucous membranes of the human mouth, nose, auditory canals, and skin was investigated in deep-sea divers and in volunteers subjected to stays for 1 to 45 days in a hyperbaric chamber. Results revealed significant increases in *P. aeruginosa* counts in samples from all sources investigated, which were larger the longer the time of the barochamber exposure. Some subjects showed symptoms of otitis externa. It was found that the main source of *P. aeruginosa* was the water supply system. Procedures for preventing infection with gram-negative bacteria under conditions of high pressure are discussed. I.S.

A92-26016

BIOCATALYSIS USING IMMOBILIZED CELLS OR ENZYMES AS A METHOD OF WATER AND AIR PURIFICATION IN A HERMETICALLY SEALED HABITAT [BIOKATALIZ NA OSNOVE IMMOBILIZOVANNYKH KLETOK ILI FERMENTOV KAK ODIN IZ PODKHODOV K OCHISTKE VODY I ATMOSFERY V OBITAEMOM GERMOOB'EKTE]

T. E. LEBEDEVA, N. M. NAZAROV, and I. E. SINIAK Kosmicheskaya Biologiya i Aviakosmicheskaya Meditsina (ISSN 0321-5044), vol. 25, Nov.-Dec. 1991, p. 42-45. In Russian. refs Copyright

The feasibility of using, in a regenerative life support system, immobilized cells to purify water and air in hermetically sealed habitats is discussed. Consideration is given to various methods for immobilizing bacteria that are selected for their adaptive abilities to assimilate organic components that need to be removed, and the suitable substances that can serve as the carriers for immobilized bacteria and enzymes. Particular attention is given to the use of denitrification bacteria immobilized on mineral carriers. The purification technique discussed here is of relevance to long-duration space missions, particularly for the flights to Mars. I.S.

A92-26019

A METHOD FOR A COMPREHENSIVE ASSESSMENT OF TECHNICAL EQUIPMENT FOR THE MEDICAL COMPARTMENT OF A SPACECRAFT [METODIKA KOMPLEKSNOI OTSENKI TEKHNIKESKOGO OSNASHCHENIYA KOSMICHESKOGO MEDITSINSKOGO BLOKA]

A. V. PERKOVSKII and B. A. ADAMOVICH Kosmicheskaya Biologiya i Aviakosmicheskaya Meditsina (ISSN 0321-5044), vol. 25, Nov.-Dec. 1991, p. 49-53. In Russian. refs Copyright

The paper describes the development of a model of a bacterial defense system (BDS) to be included in the medical compartment or medical section of a spacecraft. The BDS is designed to maintain, in the area designated for medical treatments, conditions of constant temperature, relative humidity, gas exchange, and desired ratios of atmospheric gases, as well as to keep low the levels of bacterial and particle contamination. Special attention is given to the method used for the assessment of the BDS, the set of factors to be assessed, and a model of a data base for computing the cost efficiency of the BDS. I.S.

A92-26333

TEMPERATURE AND HUMIDITY WITHIN THE CLOTHING MICROENVIRONMENT

PATRICK J. SULLIVAN (Canadian Space Agency, Ottawa, Canada) and IGOR B. MEKJAVIC (Simon Fraser University, Burnaby, Canada) Aviation, Space, and Environmental Medicine (ISSN

0095-6562), vol. 63, March 1992, p. 186-192. Research supported by Science Council of British Columbia and NSERC. refs
Copyright

Different types of clothing are used by human subjects exposed to linear increases in ambient temperature to assess the microenvironmental conditions within the clothing. Subjects in four types of helicopter suits are exposed to a temperature increase from 20 to 40 C over 90 min followed by 90 min at 40 C unchanged. The subjects are monitored continuously to determine the temperature, relative humidity, and vapor pressure within the clothing microenvironment as well as body temperature. The relative humidity and vapor pressure data indicate that the microenvironment leads to more extreme conditions than the ambient air. The temperature is found to remain at a slightly lower level within the microenvironment. The differences between the types of clothing are discussed with reference to material qualities such as permeability. The findings suggest that the microenvironment of protective clothing must be evaluated in conjunction with ambient environmental parameters. C.C.S.

A92-26660* Jet Propulsion Lab., California Inst. of Tech., Pasadena.

SUPERVISORY TELEROBOTICS TESTBED FOR UNSTRUCTURED ENVIRONMENTS

S. HAYATI and J. BALARAM (JPL, Pasadena, CA) Journal of Robotic Systems (ISSN 0741-2223), vol. 9, March 1992, p. 261-280. refs

A telerobotics testbed for performing tasks such as assembly and repair of spacecraft in unstructured environments is described. This fully operational multiarm system can operate in teleoperated or supervisory control modes, as well as mixed shared-control modes, thus enabling operations in totally to partially unstructured environments. Various sources of uncertainty are identified and approaches to minimize their effects are presented. In the teleoperated mode, the system uses two force-reflecting hand controllers to operate two manipulator arms. A third arm is utilized to position four cameras to view the scene. In the supervisory mode, the system can be operated from three different levels: task, process, and servo levels, providing different levels of autonomy and performance. Various tools are provided so that an operator can perform tasks even when objects are partially occluded or their positions are not known a priori. P.D.

A92-27373

ARM OF THE FUTURE

IAN PARKER Space (ISSN 0267-954X), vol. 8, Feb.-Mar. 1992, p. 38, 39, 41.
Copyright

The use of robotics to service the Space Station Freedom is described in terms of the Hermes Robot Arm (HRA) presently being developed which can reduce total costs. The HRA project is based on the parallel development of the manipulator arm, the control system, and simulation and test facilities to investigate indirect vision, relocatability, and in-orbit maintenance of the HRA. A high degree of redundancy is designed into the HRA to protect against failures, and the HRA incorporates an optical sensor and a proximity sensor to aid service operations. C.C.S.

A92-28150

NEAR-MINIMUM-TIME CONTROL OF A FLEXIBLE MANIPULATOR

N. K. HECHT and J. L. JUNKINS (Texas A & M University, College Station) Journal of Guidance, Control, and Dynamics (ISSN 0731-5090), vol. 15, Mar.-Apr. 1992, p. 477-481. Research supported by Texas Advanced Technology Program. Previously cited in issue 24, p. 3900, Accession no. A90-52997. refs
(Contract F49620-87-C-0078)
Copyright

N92-18009# Army Research Inst. for the Behavioral and Social Sciences, Alexandria, VA.

COMPUTER SIMULATION MODEL OF COCKPIT CREW COORDINATION: A CREW-LEVEL ERROR MODEL FOR THE US ARMY'S BLACKHAWK HELICOPTER

WILLIAM E. GRIFFITH and JOHN E. STEWART, II Sep. 1991 69 p
(AD-A243618; ARI-RR-1601) Avail: NTIS HC/MF A04 CSCL 23/2

The purpose of this research effort was to build a crew performance computer model, using Micro Saint, a modeling framework which has been used extensively to model workload. The current model should be able to predict crew navigation and obstacle clearance errors as a function of crew workload and a variety of other variables not directly tied to workload (e.g., crew experience and familiarity, and mission threat environment). The UH-60 Blackhawk helicopter was chosen because it is a complex two-pilot aircraft. Terrain flight navigation was selected as the mission because of workload demands and the necessity that crew members communicate and coordinate with one another. This report details the conceptual development of the model and presents preliminary results from parametric experiments that were performed to validate it. Comparisons are made of workload and error probabilities for two variants of the Blackhawk: the UH-60 utility aircraft, and the MH-60K, a special operations variant soon to enter production. GRA

N92-18051# Aeronautical Research Labs., Melbourne (Australia).

AIRCREW TASKS AND COGNITIVE COMPLEXITY

J. G. MANTON and P. K. HUGHES Nov. 1991 27 p Presented at the Silver Jubilee Conference of the Australian Psychological Society, Melbourne, Australia, 23-28 Sep. 1990
(ARL-SYS-TM-150; AR-006-650) Copyright Avail: NTIS HC/MF A03

There is an increasing demand for human factors engineering of aircrew tasks during the design and development of future aircraft cockpits and aircrew workstations. The extensive data base of experimental research literature on human performance is of marginal value in aiding the design process. Outlined here are several techniques associated with the analysis and description of aircrew activities for use in prospective studies of aircrew task design. The techniques of protocol analysis, eye movement monitoring, and task analysis, among others, are reviewed. The underlying issue of cognitive complexity in the management of aircrew interfaces is addressed. Author

N92-18080# Naval Postgraduate School, Monterey, CA.

A MANAGEMENT PROPOSAL FOR DETERMINING THE EFFECTS OF COMBAT STRESS ON THE MAN-MACHINE INTERFACE OF COMPLEX INFORMATION DISPLAY SYSTEMS
M.S. Thesis

KAREN M. KEMPTON Dec. 1990 69 p
(AD-A243422) Avail: NTIS HC/MF A04 CSCL 05/8

This thesis culminates in a management plan for determining the effects of combat stress on the man-machine interface of complex information display systems. The objective is to provide to the reader background information detailing the historical development of military attitudes towards combat stress and a survey of the physiological and psychological factors which influence the resolution of this problem. Current research in these areas is discussed with emphasis on research which supports the problem's resolution. The management plan cites those agencies that have a specific background, expertise, and capability to accomplish portions of the research. For concepts requiring further study, individuals within established institutions whom are currently addressing these areas are suggested. An overall program coordinator is recommended. In conclusion, recommendations for implementation of changes in the areas of training and acquisition are cited. GRA

N92-18481# Messerschmitt-Boelkow-Blohm G.m.b.H., Munich (Germany, F.R.). Product Assurance Support.

ORGANIZATIONAL ASPECTS FOR PREVENTING HUMAN FAULTS IN SPACE SYSTEMS: SYSTEMS ENGINEERING APPROACHES TO TOTAL QUALITY MANAGEMENT

HANS JOERG KELLER 1991 24 p Presented at the ESA Symposium on Space Product Assurance for Europe in the 1990s, Noordwijk, Netherlands, 15-19 Apr. 1991

(MBB-UK-0139-91-PUB; ETN-92-90600) Avail: NTIS HC/MF A03

Approaches for improving the quality of human action, based on the fundamental systems engineering concept of interacting cybernetic control loops, are discussed. Such approaches are designed to result in Total Quality Management (TQM) principles. Motivational topdown conclusions are drawn in considering the modes of human orientation in a surrounding environment. A bottom up approach based on individual failure causes is matched with a standard model of individual responsibility. A more general collective tree model of system engineering tasks provides a preliminary survey of problem roots and respective problem solving branches which are further broken down. ESA

N92-18516# University of Northeastern Illinois, Chicago.

INDIVIDUAL DIFFERENCE EFFECTS IN HUMAN-COMPUTER INTERACTION Final Report

ANITA K. AMBARDAR Oct. 1991 225 p

(Contract MDA903-82-C-0157)

(AD-A243172; ARI-RN-92-05) Avail: NTIS HC/MF A10 CSDL 23/2

The optimum design for human-computer interfaces has become an increasingly important concern. Optimization requires interface to match the characteristics of the user with those of the computer system. At present, it is not clear what user characteristics, beyond a limited set related to experience and training, should be considered. This research project addresses this question. Many forms of human-computer interaction can be viewed as problem-solving activities. Therefore, the cognitive characteristics that affect problem-solving performance may also affect problem-solving performance in the context of user interaction with a computer system. The ideas addressed in this research program were these: (1) how fundamental, inherent individual difference dimensions of cognitive operations might influence interface design; (2) what cognitive dimension, beyond experience, is really important to human-computer interaction; and (3) aside from the classification of users into expert and novice categories, a given interface design is equally good in supporting the problem solving activity of any particular person. Two experiments were conducted. The results revealed that efficiency in using computer systems depends on user cognitive characteristics and design features of computer interface. Further, usage of interface design features significantly interacts with a subject's fundamental cognitive characteristics/cognitive style. GRA

N92-18816# Pennsylvania Univ., Philadelphia. Dept. of Engineering.

MULTIDIMENSIONAL SIGNAL CODING IN THE VISUAL

SYSTEM Annual Report No. 1, 1 Nov. 1990 - 31 Oct. 1991

GERSHON BUCHSBAUM 30 Nov. 1991 6 p

(Contract AF-AFOSR-0082-91; AF PROJ. 2313)

(AD-A244281; AFOSR-91-1013TR) Avail: NTIS HC/MF A02 CSDL 06/4

This work shows that units in the visual system are tuned to principal components of real world color natural images and provides insight on the strategy the visual system may be using to confront natural imagery. In addition, we developed an efficient coding model for natural time varying imagery in the early visual system. GRA

N92-18927*# FWG Associates, Inc., Tullahoma, TN.

CHEMICAL HAZARDS DATABASE AND DETECTION SYSTEM FOR MICROGRAVITY AND MATERIALS PROCESSING FACILITY (MMPF) Final Report

JIMMY STEELE and ROBERT E. SMITH 14 Oct. 1991 67 p

(Contract NAS8-37746)

(NASA-CR-184274; NAS 1.26:184274) Avail: NTIS HC/MF A04 CSDL 06/11

The ability to identify contaminants associated with experiments and facilities is directly related to the safety of the Space Station. A means of identifying these contaminants has been developed through this contracting effort. The delivered system provides a listing of the materials and/or chemicals associated with each facility, information as to the contaminant's physical state, a list of the quantity and/or volume of each suspected contaminant, a database of the toxicological hazards associated with each contaminant, a recommended means of rapid identification of the contaminants under operational conditions, a method of identifying possible failure modes and effects analysis associated with each facility, and a fault tree-type analysis that will provide a means of identifying potential hazardous conditions related to future planned missions. Author

N92-18988# British Aerospace Aircraft Group, Kingston-upon-Thames (England).

THE MILITARY AIRCREW HEAD SUPPORT SYSTEM (MAHSS)

A. A. MARSHALL In AGARD, High Altitude and High Acceleration Protection for Military Aircrew 5 p Oct. 1991

Copyright Avail: NTIS HC/MF A12; Non-NATO Nationals requests available only from AGARD/Scientific Publications Executive

The Military Aircrew Head Support System (MAHSS) is designed to give the pilot extra support to his head and torso by means of cables under the control of a microprocessor. This calculates the expected tension on the cables under the prevailing G forces. It then compares these values with the actual strain on the cables. Any differences in tension to those calculated should be as a result of the pilot trying to move, and the cables will be adjusted to assist him. The MAHSS should offer benefits in terms of less fatigue (biology) and injury and the ability of the pilot to move his head while maneuvering without the danger of getting stuck in a slumped position during high G. It could also be useful during the ejection sequence, by reeling in the cables and this stabilizing the pilot's body and spine in the line of the ejection force. A simplified system was tested to 6 G in a human centrifuge with manual control of the cable lengths. The development of the system is described, including biomechanical modeling and a study into its acceptability to pilots, and other human factors issues. Author

N92-18993# Royal Air Force Inst. of Aviation Medicine, Farnborough (England).

PHYSIOLOGICAL REQUIREMENTS FOR PARTIAL PRESSURE ASSEMBLIES FOR ALTITUDE PROTECTION

A. J. F. MACMILLAN In AGARD, High Altitude and High Acceleration Protection for Military Aircrew 7 p Oct. 1991

Copyright Avail: NTIS HC/MF A12; Non-NATO Nationals requests available only from AGARD/Scientific Publications Executive

Partial pressure assemblies using an oronasal mask and garments providing counter pressure to the torso and lower limbs may be used to provide protection against a short term exposure (1 to 2 minutes) to altitudes up to 60,000 to 65,000 feet. The performance characteristics of the delivery system used in such emergency exposures must be at least as good as that required during routine operations. Mask cavity pressure of up to 80 mmHg may be tolerated for a short period, provided adequate chest and lower limb counter pressure is provided. When upper body counter pressure is limited to the chest, then anti-G suit pressure should be at least 3 times the breathing pressure. Further tradeoffs of breathing pressure and counter pressure against absolute oxygen pressure with the use of gas mixtures with less than 100 percent oxygen should be defined by examining the effect of these tradeoffs on performance, arterial gas tensions and cardiovascular responses. Author

N92-18994# Laboratoire de Medecine Aerospatiale, Bretigny-sur-Orge (France). Centre d'Essais en Vol.

FRENCH EQUIPMENT FOR INTEGRATED PROTECTION OF COMBAT AIRCRAFT CREWS: PRINCIPLES AND TESTS AT HIGH ALTITUDES [L'EQUIPEMENT FRANCAIS DE PROTECTION INTEGREE POUR EQUIPAGES D'AVIONS DE COMBAT MODERNE: PRINCIPES ET ESSAIS EN HAUTE ALTITUDE]

HENRI MAROTTE, HENRI VIEILLEFOND (Service de Sante des Armees, Paris, France), DAMIEN LEJEUNE, and JEAN-MICHEL CLERE /n AGARD, High Altitude and High Acceleration Protection for Military Aircrew 11 p Oct. 1991 In FRENCH; ENGLISH summary

Copyright Avail: NTIS HC/MF A12; Non-NATO Nationals requests available only from AGARD/Scientific Publications Executive

Personal flight equipment, manufactured and tested in France, to be used to protect aircraft crews against the risk of loss of pressurization at high altitudes is discussed. Slow decompression tests up to 60,000 feet showed that the altimetric positive pressure schedule was badly adapted for this kind of equipment. Specific schedules for altimetric dilution and positive pressure were established and tested with a series of rapid decompression experiments (in 2 seconds). Some explosive decompression tests were also performed. The homologation was obtained for the maximum altitude of 65,000 feet, maximum duration above 40,000 feet of 2 to 3 minutes, and an aircraft pressurization schedule of 35 kPa. Author

N92-18995# Royal Air Force Inst. of Aviation Medicine, Farnborough (England).

THE EXPERIMENTAL ASSESSMENT OF NEW PARTIAL PRESSURE ASSEMBLIES

D. P. GRADWELL /n AGARD, High Altitude and High Acceleration Protection for Military Aircrew 5 p Oct. 1991

Copyright Avail: NTIS HC/MF A12; Non-NATO Nationals requests available only from AGARD/Scientific Publications Executive

A new generation of partial pressure assemblies were assessed with particular reference to the optimization of counter-pressure relationships. A system of non-invasive assessment of the physiological consequences of using such assemblies during pressure breathing and following rapid decompression to altitudes between 45,000 and 60,000 feet were developed. The methods used are described and an outline of the results achievable with this system are discussed. The physiological benefits of enhanced lower body counter-pressure compared with uniform levels of pressure garment inflation are described. Suggestions for further research are given. Author

N92-18996# Laboratoire de Medecine Aerospatiale, Bretigny-sur-Orge (France). Centre d'Essais en Vol.

PHYSIOLOGICAL PROTECTION EQUIPMENT FOR COMBAT AIRCRAFT: INTEGRATION OF FUNCTIONS, PRINCIPAL TECHNOLOGIES [PROTECTION PHYSIOLOGIQUE DES EQUIPAGES D'AVIONS DE COMBAT: INTEGRATION DE FONCTIONS, PRINCIPES TECHNOLOGIQUES]

HENRI MAROTTE, RAYMOND BEAUSSANT, RICHARD ZAPATA (L'Air Liquide, Sassenage, France), JEAN-MICHEL CLERE, and DAMIEN LEJEUNE /n AGARD, High Altitude and High Acceleration Protection for Military Aircrew 8 p Oct. 1991 In FRENCH; ENGLISH summary

Copyright Avail: NTIS HC/MF A12; Non-NATO Nationals requests available only from AGARD/Scientific Publications Executive

New generation combat aircraft crews are submitted to many kinds of constraints during flight. New technologies were developed, such as the molecular sieve oxygen concentrator (MSOC) or the electronic technology for command and/or control of regulation systems. The equipment developed allows a survey of data from the unlimited oxygen supply, with low pressure oxygen regulation systems, to anti-G protection, thanks to the assisted positive pressure breathing (APPB) apparatus. These systems are orderly integrated into the same multiple equipment systems with both respiratory and anti-G functions. New perspectives were developed: altimetric dilution schedules usable with a partial pressure suit;

compatibility of the flight equipment with non-integrated functions; and thermal (cold) protection in case of accidental immersion or nonbattle casualty (NBC) protection equipment. Author

N92-18997# Toronto Univ. (Ontario). Dept. of Mechanical Engineering.

MODEL OF AIR FLOW IN A MULTI-BLADDER PHYSIOLOGICAL PROTECTION SYSTEM

P. S. E. FARRELL, D. F. JAMES, and A. A. GOLDENBERG /n AGARD, High Altitude and High Acceleration Protection for Military Aircrew 5 p Oct. 1991

Copyright Avail: NTIS HC/MF A12; Non-NATO Nationals requests available only from AGARD/Scientific Publications Executive

New physiological protection systems are needed in order to keep the pilot in control of the aircraft during high G and high altitude maneuvers. A model was developed for air flow in a multi-bladder physiological protection system. Each bladder of the protection system is modeled as a flexible pressure vessel. The governing equations are derived for fluid flow from one vessel to another. The equations are simplified by five assumptions which are based on the fluid being compressible and inviscid. The result is a set of nonlinear differential equations which describe the isentropic pressure variation within the vessels. The equations are integrated numerically and yield the thermodynamic quantities within each vessel as a function of time. Based on the differential equations, a computer simulation of the flexible pressure vessel model was performed. The simulation allows for many possible configurations and scenarios. Five basic configurations are discussed here. Author

N92-18998# Royal Aircraft Establishment, Farnborough (England). Aircrew Integration Section.

THE DESIGN AND DEVELOPMENT OF A FULL-COVER PARTIAL PRESSURE ASSEMBLY FOR PROTECTION AGAINST HIGH ALTITUDE AND G

A. E. HAY and JUDY E. APLIN /n AGARD, High Altitude and High Acceleration Protection for Military Aircrew 6 p Oct. 1991

Copyright Avail: NTIS HC/MF A12; Non-NATO Nationals requests available only from AGARD/Scientific Publications Executive

A partial pressure assembly comprising a chest counter pressure garment (CCPG) and full-cover trousers (FAGTS) were designed and constructed. The CCPG is a simple two-layer outer garment located under the life preserver and supplied with breathing gas from the demand regulator. The FAGTS comprise a single bladder which covers the abdomen, legs, and feet, retained by an outer inextendable layer of Nomex, with the ability to be donned quickly by employing zips and low friction lacing for final fit adjustment. Gas supplied from a suitably programmed G-valve inflates the garment to provide protection. Details of the design approach and the developmental stages to date are given together with an outline of the anthropometric considerations required to provide a snug fitting assembly from a limited size roll. Author

N92-18999# Normalair-Garrett Ltd., Yeovil (England). Military Breathing Systems.

ADVANCES IN THE DESIGN OF MILITARY AIRCREW BREATHING SYSTEMS WITH RESPECT TO HIGH ALTITUDE AND HIGH ACCELERATION CONDITIONS

NIGEL P. J. LOVETT /n AGARD, High Altitude and High Acceleration Protection for Military Aircrew 4 p Oct. 1991

Copyright Avail: NTIS HC/MF A12; Non-NATO Nationals requests available only from AGARD/Scientific Publications Executive

It was concluded that for future aircraft systems the combining of an anti-gravity valve and a breathing regulator into one unit provides the most compact and effective system. The advances made by the research establishments in the development of new aircrew garments reduces the need for quick response, electronically controlled valves, thus suggesting that mechanically controlled systems still provide the optimum protection for aircrews under high acceleration conditions. Author

N92-19000# Royal Air Force Inst. of Aviation Medicine, Farnborough (England).

HIGH ALTITUDE HIGH ACCELERATION AND NBC WARFARE PROTECTIVE SYSTEM FOR ADVANCED FIGHTER AIRCRAFT: DESIGN CONSIDERATIONS

A. J. F. MACMILLAN /in AGARD, High Altitude and High Acceleration Protection for Military Aircrew 7 p Oct. 1991
Copyright Avail: NTIS HC/MF A12; Non-NATO Nationals requests available only from AGARD/Scientific Publications Executive

The physiological, technical and flight safety aspects of the design of an integrated system providing protection against high sustained acceleration, short duration exposure to high altitude and nuclear-biological-chemical (NBC) warfare agents are discussed. The proposed system employs a molecular sieve oxygen concentrator and seat mounted demand regulator and anti-gravity valve together with a source of clean filtered air and an emergency gaseous oxygen supply. The personal equipment assembly comprises counter pressure garments worn external to the NBC protective layer and a man-mounted filter. The filter assembly is used on the ground with a portable ventilator, in the air connected to the breathing gas supply, and post escape as part of a lung powered respirator system. Author

N92-19008# Advisory Group for Aerospace Research and Development, Neuilly-Sur-Seine (France). Aerospace Medical Panel.

HELMET MOUNTED DISPLAYS AND NIGHT VISION GOGGLES

Dec. 1991 121 p In ENGLISH and FRENCH Symposium held in Pensacola, FL, 2 May 1991

(AGARD-CP-517; ISBN-92-835-0645-6) Copyright Avail: NTIS HC/MF A06; Non-NATO Nationals requests available only from AGARD/Scientific Publications Executive

Papers covered basic and applied issues related to human factors and device integration. Three papers considered the ergonomics of helmet design and the snugness of fit to the head and the integration of new helmet mounted devices with existing equipment. Two papers considered the effects of novel helmet designs on the pilot's ability to control head position and avoid fatigue. Two papers reported in-flight testing of human performance using novel devices. Several papers considered the human factors of visual performance related to such topics as degree of binocular overlap, overall field of view, and the ability to maintain level flight. Other papers considered issues of the nature of information displayed, including data fused from multiple sources and the design of abstract symbolologies that present parameters of flight.

N92-19009# IBIS Aerosystems Ltd., Sharnbrook (England).

FIXED WING NIGHT ATTACK EO INTEGRATION AND SENSOR FUSION

LES EVANS /in AGARD, Helmet Mounted Displays and Night Vision Goggles 5 p Dec. 1991

Copyright Avail: NTIS HC/MF A06; Non-NATO Nationals requests available only from AGARD/Scientific Publications Executive

Discussed here are some of the aeromedical aspects of the development of fixed wing night attack using electro-optic sensors. Addressed are some of the problems encountered when night vision goggles (NVG's) and Forward Looking Infra-Red (FLIR) equipment were integrated into a complete airborne system. The aeromedical problems encountered when NVG's were used in fast jet aircraft are discussed. It was found that helmet fit had to be tight to ensure that the high helmet rotational forces produced by normal accelerations were contained, and also that when wearing NVG's while pulling 'g', a tumbling sensation could be induced in the pilot by head movements. Author

N92-19010# Royal Aircraft Establishment, Farnborough (England). Flight Systems Dept.

THE DESIGN AND EVALUATION OF FAST-JET HELMET MOUNTED DISPLAYS

A. KARAVIS and G. J. N. CLARKSON /in AGARD, Helmet Mounted Displays and Night Vision Goggles 8 p Dec. 1991

Copyright Avail: NTIS HC/MF A06; Non-NATO Nationals requests available only from AGARD/Scientific Publications Executive

The design philosophy adopted by the Flight Systems Department of the Royal Aerospace Establishment (RAE), Farnborough for its fast-jet helmet display program is discussed. Details are given on the development of two devices and the tests and methods used to meet flight safety measurements. The devices, a Helmet Mounted Sight (HMS) and an Oxygen Mask Mounted Sight (OMMS), each posed different problems due to their inherently dissimilar concepts. Modifications to these devices as a result of ground and air testing to meet flight safety and operational requirements are covered. The ergonomic considerations applicable to the use of these and other head mounted devices when employed as integral components of the weapon system are also discussed. A brief account is given of display design considerations. Two helmet devices were successfully produced for evaluation in a combat environment. Author

N92-19011# Messerschmitt-Boelkow-Blohm G.m.b.H., Munich (Germany, F.R.). Helicopter Div.

HELICOPTER INTEGRATED HELMET REQUIREMENTS AND TEST RESULTS

HANS-DIETER VONBOEHM and HERBERT SCHREYER /in AGARD, Helmet Mounted Displays and Night Vision Goggles 17 p Dec. 1991 Previously announced as N92-12422

Copyright Avail: NTIS HC/MF A06; Non-NATO Nationals requests available only from AGARD/Scientific Publications Executive

Integrated Helmet (IH) requirements for helicopter applications and some test results are given. A modern IH consists of two Image Intensifier Tubes (IIT) and two Cathode Ray Tubes (CRT) with an optical system, including combiners to present binocular images. Additional symbology can be superimposed on the CRT or IIT image. An IH is a further development of a helmet mounted display. A Helmet Mounted Sight (HMS) can steer a sensor platform with a thermal camera, or an air to air missile system. The main helicopter requirements of such a system are given. Author

N92-19012# Aerospace Medical Research Labs., Wright-Patterson AFB, OH. Human Engineering Div.

AN EVALUATION OF THE PROTECTIVE INTEGRATED HOOD MASK FOR ANVIS NIGHT VISION GOGGLE COMPATIBILITY

MARY M. DONOHUE-PERRY and JOSEPH T. RIEGLER (Logicon Technical Services, Inc., Dayton, OH.) /in AGARD, Helmet Mounted Displays and Night Vision Goggles 4 p Dec. 1991

Copyright Avail: NTIS HC/MF A06; Non-NATO Nationals requests available only from AGARD/Scientific Publications Executive

An evaluation was conducted to determine potential compatibility problems found while using the Protective Integrated Hood Mask (PIHM) with the Aviator's Night Vision Imaging System (ANVIS). The evaluation consisted of field tests performed at Pope Air Force Base using qualified C-130E crewmembers, and laboratory tests conducted at Wright-Patterson Air Force Base. Examinations of horizontal and vertical intensified fields of view, cockpit lighting compatibility, and a subjective evaluation of fit were conducted at Pope Air Force Base. Visual acuity through the ANVIS/PIHM, and distortion and transmissivity of the PIHM visor were determined Wright Patterson Air Force Base. Acuity through ANVIS with and without PIHM was assessed under quarter moon and starlight illuminations. Acuity was tested using 20 percent and 90 percent Landolt C targets depicted in one of four orientations. Overall conclusions were that potential compatibility problems of ANVIS and PIHM can be reduced or eliminated with proper fit and adjustment of the ANVIS/PIHM. Author

N92-19013# Royal Air Force Inst. of Aviation Medicine, Farnborough (England).

THE RAF INSTITUTE OF AVIATION MEDICINE PROPOSED HELMET FITTING/RETENTION SYSTEM

JOHN V. BARSON and ROGER J. CROFT /in AGARD, Helmet Mounted Displays and Night Vision Goggles 5 p Dec. 1991

Copyright Avail: NTIS HC/MF A06; Non-NATO Nationals requests available only from AGARD/Scientific Publications Executive

The role of the protective flying helmet has expanded from being a device for protecting the flyer from impact and noise

hazards to include mounting platforms for vision enhancement devices as well as target sighting and designation systems. A new helmet fitting and/or retention system is described that has the potential to provide a quick and effective method of rendering a good, safe, and stable helmet fit using a minimum number of helmet sizes. The fitting or retention system also provides a relatively consistent eye position for optical systems and allows rapid donning of a chemical defense respirator. Also, the fitting or retention system can be used for a 'one size fits all' helmet while retaining all the features for personnel who are only flying on specific missions and normally are not issued a flight helmet. The system uses a series of straps and an occipital pusher plate to accommodate head length. The height adjustment is provided by a specifically shaped and contoured pad in the top of the helmet which contacts the head in such a way and over a large area to correctly position the helmet vertically on the head for a wide range of pupil-vertex heights. Author

N92-19014# Laboratoire de Medecine Aerospatiale, Bretigny-sur-Orge (France). Centre d'Essais en Vol.
BIOMECHANICAL RESPONSE OF THE HEAD TO G+ ACCELERATIONS: BENEFIT FOR STUDIES IN COMBAT SIMULATORS [REPOSE BIOMECHANIQUE DE LA TETE AUX ACCELERATIONS+ GZ: INTERET POUR LES ETUDES EN SIMULATEUR DE COMBAT]

A. LEGER, P. SANDOR, C. BOURSE, and A. ALAIN /in AGARD, Helmet Mounted Displays and Night Vision Goggles 9 p Dec. 1991 In FRENCH Prepared in cooperation with Centre d'Electronique de l'Armement, Bruz (France)
 Copyright Avail: NTIS HC/MF A06; Non-NATO Nationals requests available only from AGARD/Scientific Publications Executive

Fixed base simulators cannot provide the effect of biomechanical constraints resulting from accelerations, which can pose problems in interpreting studies of helmet mounted sights. One study, in a human centrifuge, of the biomechanical response of the head during an orientation task was conducted for different gradients of variation of acceleration (0.3, 0.6, and 1 G/s). Terminal acceleration in every case plateaued at +5 G. The results obtained show that the stability of the orientation (Mean Quadratic Deviation) on an infinitely collimated target varied from 0.8 deg at 0.3 G/s to more than 2 deg at 1 G/s. The characteristics of the biomechanical response of the head were analyzed. Practical recommendations are made for modeling the effect of the biomechanical constraint at the time of combat simulator studies.

Transl. by M.G.

N92-19015# New Orleans Univ., LA. Dept. of Mathematics.
A KINEMATIC MODEL FOR PREDICTING THE EFFECTS OF HELMET MOUNTED SYSTEMS

TERRY A. WATKINS, M. S. WEISS, D. W. CALL, and S. J. GUCCIONE, JR. (Naval Biodynamics Lab., New Orleans, LA.) /in AGARD, Helmet Mounted Displays and Night Vision Goggles 7 p Dec. 1991
 Copyright Avail: NTIS HC/MF A06; Non-NATO Nationals requests available only from AGARD/Scientific Publications Executive

A statistical study was made using head kinematic response data from a set of 79 human -X impact acceleration tests. Five volunteer subjects were tested successively in three configurations: (1) no helmet; (2) helmet only; and (3) helmet with weights. The peak acceleration levels ranged from 3 to 10 g. Three kinematic responses, the X and Z components of the linear acceleration and the Y axis angular acceleration, were analyzed. These acceleration curves were fitted with polynomial splines using least squares techniques. The fitted peaks and times to peak were then regressed against sled acceleration, initial head orientation and head/neck anthropometric parameters. Statistical measures of goodness of fit were highly significant. The regression equations were used to simulate the effects of varying individual parameters (such as total head mass, peak sled acceleration, neck length, etc.). The results show an analytical approach for extrapolating human neck/head kinematics to levels and types of exposure where injury would be expected. Future applications of this

modeling technique include analysis of the effects of mass distribution parameters on head/neck dynamic response to +Z vertical impact acceleration. Author

N92-19016# British Aerospace Public Ltd. Co., Bristol (England). Human Factors Dept.

THE EFFECTS UPON VISUAL PERFORMANCE OF VARYING BINOCULAR OVERLAP

G. K. EDGAR, K. T. CARR, M. WILLIAMS, J. PAGE, and A. L. CLARKE /in AGARD, Helmet Mounted Displays and Night Vision Goggles 15 p Dec. 1991

Copyright Avail: NTIS HC/MF A06; Non-NATO Nationals requests available only from AGARD/Scientific Publications Executive

In a helmet mounted display, there is a tradeoff between the binocular overlap of the images presented to each eye and the total field of view. It is therefore desirable to see whether decreasing the binocular overlap (and thus making possible a large total FOV) adversely affects performance. The results are reported of four experiments examining the effects of different binocular overlaps upon performance on a visual search task, and the factors that may explain any differences in the results obtained with different overlap conditions. The results indicated that performance was poorer in all non-100 pct. overlap conditions, and suggested that this decrement in performance could be explained by the presence of depth boundaries introduced by a disparity between the images presented to each eye. Author

N92-19017# Laboratoire de Medecine Aerospatiale, Bretigny-sur-Orge (France).

RESTRICTION OF THE FIELD OF VISION: INFLUENCE ON EYE-HEAD COORDINATION DURING ORIENTATION TOWARDS AN ECCENTRIC TARGET [RESTRICTION DU CHAMP DE VISION: INFLUENCE SUR LA COORDINATION OEIL-TETE PENDANT L'ORIENTATION VERS UNE CIBLE EXCENTREE]

PATRICK SANDOR and ALAIN LEGER /in AGARD, Helmet Mounted Displays and Night Vision Goggles 6 p Dec. 1991 In FRENCH

Copyright Avail: NTIS HC/MF A06; Non-NATO Nationals requests available only from AGARD/Scientific Publications Executive

Vision in a limited field of vision deviates more and more frequently with use of optronic helmet-mounted systems. The consequences of restricted field on the characteristics of eye-head coordination were studied during a task of orientation toward an eccentric pinpoint target. Three sizes of binocular fields were tested (20 degree, 70 degree, and free field). A pinpoint target is projected onto a round screen in a horizontal plane passing in front of the subject's eyes. The target is presented with three different eccentricities: 45, 65, and 85 degrees. The tests are carried out in two modes: expected and semi-expected, where only the side (left or right) is indicated. The unexpectedness increases the time to acquisition. It is accompanied by an increase in the number of eye motions. The mean and maximum rates of eye motion seem to be maintained constant by means of continual adjustment of eye and head speeds. Amplitude limitation of the eye movements linked to vision restriction is not compensated by use of the entire available field. Generally, only the half-field of vision of the same side as the displacement is used. In conclusion, the results show that restriction of the field of vision modifies the motor behaviors involved in eye-head coordination, especially when the placement of the target is unexpected. An understanding of these mechanisms can eventually contribute to optimizing the use of helmet-mounted optronic devices. Author

N92-19018# Aerospace Medical Research Labs., Wright-Patterson AFB, OH. Human Engineering Div.

THE EFFECT OF FIELD-OF-VIEW SIZE ON PERFORMANCE OF A SIMULATED AIR-TO-GROUND NIGHT ATTACK

ROBERT K. OSGOOD and MAXWELL J. WELLS (Logicon Technical Services, Inc., Dayton, OH.) /in AGARD, Helmet Mounted Displays and Night Vision Goggles 7 p Dec. 1991

Copyright Avail: NTIS HC/MF A06; Non-NATO Nationals requests available only from AGARD/Scientific Publications Executive

Five experienced fighter pilots flew a simulated, night attack, pop-up bomb delivery, with a flight simulator that had a head-mounted display. The mission was conducted with an aircraft-fixed forward looking infrared sensor (FLIR) or a head-steered FLIR. With the head-steered FLIR, the sensor image was viewed on a helmet-mounted display, whereas, the aircraft-fixed FLIR was presented on a heads-up display (HUD). With both types of sensor, the field of view (FOV) size may affect performance, and to provide data for the determination of the minimum FOV size for helmet-mounted displays (HMD's). With a head-steered sensor, subjects acquired the targets earlier in the mission and released their bomb at a higher altitude. Increasing the size of the FOV also resulted in earlier target acquisition. It is explained how early target acquisition allowed subjects to modify their flight paths and position their aircraft for higher releases. Using criterion, HMD FOV's of 20 and 30 degrees were significantly worse than FOV's of 40, 60, or 80 degrees. Author

N92-19019# Centre d'Etudes et de Recherches de Medecine Aeronautique, Paris (France). Div. Vision et Ergonomie.

DOES THE FUTURE LIE IN BINOCULAR HELMET DISPLAY? [L'AVENIR EST-IL AU VISUEL DE CASQUE BINOCULAIRE?]

CORINNE ROUMES, JUSTIN PLANTIER, and JEAN-PIERRE MENU /in AGARD, Helmet Mounted Displays and Night Vision Goggles 9 p Dec. 1991 In FRENCH

Copyright Avail: NTIS HC/MF A06; Non-NATO Nationals requests available only from AGARD/Scientific Publications Executive

The introduction of a binocular capability in helmet displays can be considered as a rebalancing of visual stimuli between the two eyes, given the specific properties of human vision. The potential advantage of binocular helmets rests with the transposition of visual processing capabilities to the conditions of image generation and reconstruction in the helmet's display. Several problems resulting from this transfer are envisaged: some require experimental investigation, especially determining the tolerance of partial binocularity and to the constraints of the aeronautical environment. In view of these difficulties, the role of binocularity in the display can be envisaged differently in the presentation of real world images through sensors or synthesized input, in the framework of an actual flight or of simulation. Author

N92-19020# Center for Night Vision and Electro-Optics, Fort Belvoir, VA.

DESIGN OF HELICOPTER NIGHT PILOTAGE SENSORS: LESSONS LEARNED FROM RECENT FLIGHT EXPERIMENTS AND FIELD ASSESSMENTS Abstract Only

RICHARD VOLLMERHAUSEN, TRANG BUI, and CAROLYN NASH /in AGARD, Helmet Mounted Displays and Night Vision Goggles 1 p Dec. 1991

Copyright Avail: NTIS HC/MF A06; Non-NATO Nationals requests available only from AGARD/Scientific Publications Executive

The Army requirement to fly helicopters at low level at night led to the development and fielding of night vision pilotage sensors. These sensors have included image intensifiers (I sup 2) operating in the near infrared as well as 8 to 12 micron thermal imagers. The design of current pilotage sensors was driven by available technology. There were no clear data for optimum pilotage sensor design, to enable the designer to trade off sensor field of view (FOV) and resolution or to predict the performance sensitivity. The Center of Night Vision and Electro-Optics (CCNVEO) is establishing design criteria for night pilotage sensors. Our program included flight experiments to define sensor characteristics which optimize flight tasks as well as assessments of the performance of fielded systems. We conclude that terrain flight can be accomplished with reasonable pilot workload using a head-tracked sensor with 40 degree FOV and 0.6 cycles per milliradian (cy/mrad) resolution. Larger FOV or better resolution will lessen workload and improve confidence; however, the ability to resolve scene detail of 0.6 cy/mrad is essential and should not be traded for increased FOV. Furthermore, a pilotage system which provides both thermal and I sup 2 imagery will significantly enhance system capability to support a variety of flight tasks under a wide range of environments. We also conclude that solid state cameras with

detector dwell time equal to the standard video field rate are not suitable for use in helicopter pilotage systems. The long dwell time leads to image blur due to the head and scene motion associated with many pilotage tasks. Author

N92-19021# Royal Aircraft Establishment, Farnborough (England). Flight Systems Dept.

HELMET MOUNTED DISPLAYS: HUMAN FACTORS AND FIDELITY

PETER L. N. NAISH and HELEN J. DUDFIELD /in AGARD, Helmet Mounted Displays and Night Vision Goggles 5 p Dec. 1991

Copyright Avail: NTIS HC/MF A06; Non-NATO Nationals requests available only from AGARD/Scientific Publications Executive

Helmet mounted display (HMD) systems, of the kind able to present what has been termed virtual reality, will not be able to present a completely faithful rendering of the world. This paper shows how non-HMD technology may be used to assess the effects of this deficiency. Three aspects of the helmet mounted system are considered, and experiments are reported, which were designed to determine the degree of reality required in flyable equipment. The areas covered are time lag in the display, the need for color, and the use of 3-D sound. It is concluded that, for the parameters considered, currently available technology is able to produce stimuli which are adequate for the anticipated use of HMDs. Author

N92-19022# Aerospace Medical Research Labs., Wright-Patterson AFB, OH. Human Engineering Div.

ATTITUDE MAINTENANCE USING AN OFF-BORESIGHT HELMET-MOUNTED VIRTUAL DISPLAY

ROBERT K. OSGOOD, ERIC E. GEISELMAN, and CHRISTOPHER S. CALHOUN (Logicon Technical Services, Inc., Dayton, OH.) /in AGARD, Helmet Mounted Displays and Night Vision Goggles 7 p Dec. 1991

Copyright Avail: NTIS HC/MF A06; Non-NATO Nationals requests available only from AGARD/Scientific Publications Executive

Helmet mounted displays (HMDs) enable flight information to be displayed within the pilot's field of view, regardless of head position in the cockpit. The present research investigates an off boresight HMD (OBHMD), which appears when the pilot's head position is greater than 20 deg from the aircraft's boresight. Nine subjects flew a simulated, low level, high speed, airborne surveillance/reconnaissance mission, while monitoring a hostile adversary aircraft. The results indicate pilots were able to spend more time and look further off boresight with an OBHMD than without one. In addition, missions with an OBHMD produced fewer terrain impacts. Author

N92-19023# Sextant Avionique, Saint Medard en Jalles (France). Div. Visualisation Interface.

DESIGN METHODOLOGY FOR A HELMET DISPLAY: ERGONOMIC ASPECTS [METHODOLOGIE DE CONCEPTION D'UN VISUEL DE CASQUE: LES ASPECTS ERGONOMIQUES]

J. M. KRAUS, P. LACROUX, and A. LEGER /in AGARD, Helmet Mounted Displays and Night Vision Goggles 6 p Dec. 1991 In FRENCH

Copyright Avail: NTIS HC/MF A06; Non-NATO Nationals requests available only from AGARD/Scientific Publications Executive

Purely from the standpoint of vision, the design of a helmet display presents relatively few differences from that of a more classic visualization device such as a head-up display. For the engineer, one of the major difficulties encountered in designing a head mounted system rests in the fact that the carrying structure is far from being as well defined as are the usual supports. The diversity of anatomical and functional specifications of the pilot's head constitutes the source of ergonomic constraints that must be taken into account. The first part of this study addressed the precise identification of the limiting constraints encountered: antropometric and biomechanical constraints as well as those of secureness, comfort, manipulation, and environment. The data from previous research, computer aided design (CAD), and the simultaneous development of ergonomic and physical models permit a global approach to these different problems. The second

part of the study exposes the essential aspects of the methodological principles used. In conclusion, reflection on the design development for helmet displays makes apparent the need for early integration of the vision aspects and physical ergonomic requirements. This is a major and indispensable asset that will lead to the creation of a device that will satisfy the requirements imposed by weapon systems and their users. Transl. by M.G.

N92-19179# Air Force Inst. of Tech., Wright-Patterson AFB, OH. School of Engineering.

APPLICATION OF FINITE ELEMENT MODELING AND ANALYSIS TO THE DESIGN OF POSITIVE PRESSURE OXYGEN MASKS M.S. Thesis

BRUCE H. BITTERMAN Dec. 1991 127 p
(AD-A244045; AFIT/GAE/ENY/91D-22) Avail: NTIS HC/MF A07 CSDL 05/8

This study investigated tools and techniques for performing finite element analysis of the MBU-20/P pilot's oxygen mask. The problem which was investigated was the fit of the mask to the face at Positive Pressure Breathing (PPB) pressures. Deformed geometry of the mask and reaction forces on the face were calculated to provide a measure of the fit. The MBU-20/P mask was first digitized by 3-D digitizer. A computer program was written to translate the digitized coordinate data to a finite element format for two commercial packages. The packages targeted were SDRC I-DEAS and PDA PATRAN. Other supplementary programs were written to perform some functions which would have been difficult to accomplish within the commercial codes. The tools and techniques developed are applicable to a wide class of problems, beyond the specific application to the oxygen mask analysis. They provide a capability to rapidly develop finite element models from existing prototypes for redesign, detailed analysis, or reverse engineering. GRA

N92-19447# Center for Night Vision and Electro-Optics, Fort Belvoir, VA.

COMPARISON OF SECOND AND THIRD GENERATION NIGHT VISION GOGGLES IN TIME-LIMITED SCENARIOS Final Report
EDWARD J. BENDER, CHARLES E. BRADFORD, and RAYMOND J. STEFANIK Jul. 1991 97 p

(AD-A244330; AMSEL-NV-TR-0080) Avail: NTIS HC/MF A05 CSDL 17/5

This report addresses eight nights of field testing which occurred at three sites (pine canopy, cluttered range, open meadow) in the Deschutes National Forest, OR, during May 1988. The primary objective of these field evaluations was to characterize changes in detection performance of second and third generation Night Vision Goggles. These changes were to be examined as a function of both allowed observation time and progressive user fatigue. GRA

N92-19772*# National Aeronautics and Space Administration. Lyndon B. Johnson Space Center, Houston, TX.

A METHOD OF EVALUATING EFFICIENCY DURING SPACE-SUITED WORK IN A NEUTRAL BUOYANCY ENVIRONMENT

MICHAEL C. GREENISEN, PHILLIP WEST, FREDERICK K. NEWTON, JOHN H. GILBERT, and WILLIAM G. SQUIRES (Texas Lutheran Coll., Seguin.) Oct. 1991 11 p
(NASA-TP-3153; S-648; NAS 1.60:3153) Avail: NTIS HC/MF A03 CSDL 05/8

The purpose was to investigate efficiency as related to the work transmission and the metabolic cost of various extravehicular activity (EVA) tasks during simulated microgravity (whole body water immersion) using three space suits. Two new prototype space station suits, AX-5 and MKIII, are pressurized at 57.2 kPa and were tested concurrently with the operationally used 29.6 kPa shuttle suit. Four male astronauts were asked to perform a fatigue trial on four upper extremity exercises during which metabolic rate and work output were measured and efficiency was calculated in each suit. The activities were selected to simulate actual EVA tasks. The test article was an underwater dynamometry system to which the astronauts were secured by foot restraints. All metabolic

data was acquired, calculated, and stored using a computerized indirect calorimetry system connected to the suit ventilation/gas supply control console. During the efficiency testing, steady state metabolic rate could be evaluated as well as work transmitted to the dynamometer. Mechanical efficiency could then be calculated for each astronaut in each suit performing each movement.

Author

N92-19808# Galaxy Scientific Corp., Mays Landing, NJ.
HUMAN FACTORS IN AVIATION MAINTENANCE, PHASE 1 Interim Report, Sep. 1989 - Jan. 1991

WILLIAM T. SHEPHERD, WILLIAM B. JOHNSON, COLIN G. DRURAY, JAMES C. TAYLOR, and DANIEL BERNINGER Nov. 1991 168 p
(AD-A243844; DOT/FAA/AM-91/16) Avail: NTIS HC/MF A08 CSDL 01/3

This human factors research in aviation maintenance addresses four tasks including studies of organizational behavior, job and task analysis in maintenance and inspection, advanced technology for training, and the application of job aiding to maintenance. The first phase of a three phase research program describes extensive preliminary investigation of airline maintenance practices. Each chapter describes the Phase 1 investigation and problem definition followed by the plan for the Phase 2 demonstrations. GRA

N92-19829# Aerospace Medical Research Labs., Wright-Patterson AFB, OH.

HORIZONTAL IMPACT TESTS OF THE ADVANCED DYNAMIC ANTHROPOMORPHIC MANIKIN (ADAM) Final Report, 1 Nov. - 30 Dec. 1988

JOSEPH P. STRZELECKI and JOHN R. BUHRMAN Apr. 1991 126 p
(Contract AF PROJ. 2868; AF PROJ. 7231)
(AD-A243857; AL-TR-1991-0096) Avail: NTIS HC/MF A07 CSDL 05/8

Forty four tests were conducted to demonstrate the structural integrity, functional capability, and stability of the electronics under impact conditions of up to -40 Gx and +14 Gy. The CREST ejection seat configuration was used along with two versions of the CREST X-Band harness. Test results indicated the Anthropomorphic Manikins are structurally sound but prone to circuit board and wiring failures. The capability of the ADAMs to reproduce specific dynamic response of human subjects taken as a whole was good, but the accuracy of the instrumentation was not able to provide measurements consistently within five percent of the true value. GRA

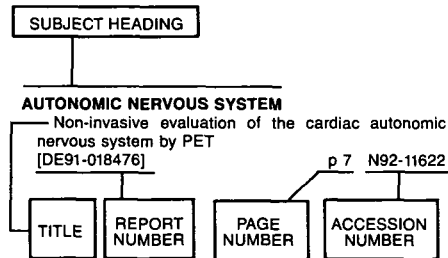
N92-19926# Centre d'Etudes et de Recherches Bio-Physiologiques Appliquees a la Marine, Toulon (France). Div. d'Electrophysiologie et Psychophysiologie.

DEVELOPMENT OF AN ELECTROMYOGRAPHY AND ACCELEROMETRY AMBULATORY RECORDING SYSTEM [MISE AU POINT D'UN SYSTEME D'ENREGISTREMENT AMBULATOIRE D'ELECTROMYOGRAPHIE ET D'ACCELEROMETRIE]

J. GRAPPERON, F. LORENZO, F. VIDAL, S. C. P. PITTET, D. BRUSCHERA, D. VILLARD, and A. TROUSSET May 1991 15 p In FRENCH; ENGLISH summary
(Contract DRET-91-1012-J)
(CERB-91-07; ETN-92-91083) Avail: NTIS HC/MF A03

An ambulatory recorder was developed to record, in aircraft, cervical electromyogram and acceleration along two axes measured on the helmet. The work consisted of the adaptation of a pre-existing polygraphic recorder (Medilog 9000). Its working under acceleration was checked, and outputs with those obtained from a laboratory recorder were compared. ESA

Typical Subject Index Listing



The subject heading is a key to the subject content of the document. The title is used to provide a description of the subject matter. When the title is insufficiently descriptive of document content, a title extension is added, separated from the title by three hyphens. The accession number and the page number are included in each entry to assist the user in locating the abstract in the abstract section. If applicable, a report number is also included as an aid in identifying the document. Under any one subject heading, the accession numbers are arranged in sequence.

A

ABNORMALITIES

The effect of various types of abnormalities of the cupuloendolymphatic system of the vestibular apparatus on the system's dynamic characteristics
p 155 A92-25259

ABSORPTION

Noninvasive determination of respiratory ozone absorption: Development of a fast-responding ozone analyzer
[PB91-243220] p 173 N92-19952

ACCELERATION PROTECTION

High Altitude and High Acceleration Protection for Military Aircrew
[AGARD-CP-516] p 168 N92-18972
G-induced loss of consciousness accidents: USAF experience 1982-1990 p 169 N92-18977
Pulmonary effects of high-G and positive pressure breathing p 169 N92-18978
The Military Aircrew Head Support System (MAHSS) p 179 N92-18988

A cardiovascular model of G-stress effects: Preliminary studies with positive pressure breathing p 171 N92-18989

Assessment of physiological requirements for protection of the human cardiovascular system against high sustained gravitational stresses p 171 N92-18990
Physiological protection equipment for combat aircraft: Integration of functions, principal technologies p 180 N92-18996

ACCELERATION STRESSES (PHYSIOLOGY)

Tolerance to chest-to-back (+Gx) and head-to-foot (+Gz) overloads during drug-induced hypohydration p 161 A92-25253
High Altitude and High Acceleration Protection for Military Aircrew [AGARD-CP-516] p 168 N92-18972
Pulmonary effects of high-G and positive pressure breathing p 169 N92-18978

Maximum intra-thoracic pressure with PBG and AGSM [DCIEM-91-43] p 169 N92-18979

The influence of high, sustained acceleration stress on electromyographic activity of the trunk and leg muscles p 170 N92-18980

Hemodynamic responses to pressure breathing during +Gz (PBG) in swine p 160 N92-18982

Subjective reports concerning assisted positive pressure breathing under high sustained acceleration p 170 N92-18983

G-LOC. Gz and brain hypoxia. Gz/s and intracranial hypertension p 170 N92-18984

Assisted positive pressure breathing: Effects on +Gz human tolerance in centrifuge p 170 N92-18985

The optimization of a positive pressure breathing system for enhanced G protection p 171 N92-18986

Effects on Gz endurance/tolerance of reduced pressure schedules using the Advanced Technology Anti-G Suite (ATAGS) p 171 N92-18987

A cardiovascular model of G-stress effects: Preliminary studies with positive pressure breathing p 171 N92-18989

Assessment of physiological requirements for protection of the human cardiovascular system against high sustained gravitational stresses p 171 N92-18990

Circulatory biomechanics effects of accelerations p 171 N92-18991

Finite element modeling of sustained +Gz acceleration induced stresses in the human ventricle myocardium p 172 N92-18992

Biomechanical response of the head to G+ accelerations: Benefit for studies in combat simulators p 182 N92-19014

A kinematic model for predicting the effects of helmet mounted systems p 182 N92-19015

Development of an electromyography and accelerometry ambulatory recording system [CERB-91-07] p 184 N92-19926

ACCELERATION TOLERANCE

Tolerance to chest-to-back (+Gx) and head-to-foot (+Gz) overloads during drug-induced hypohydration p 161 A92-25253

G-endurance during heat stress and balanced pressure breathing p 165 A92-26331

G-induced loss of consciousness accidents: USAF experience 1982-1990 p 169 N92-18977

The Valsalva maneuver and its limited value in predicting +Gz-tolerance p 170 N92-18981

Subjective reports concerning assisted positive pressure breathing under high sustained acceleration p 170 N92-18983

Assisted positive pressure breathing: Effects on +Gz human tolerance in centrifuge p 170 N92-18985

ACCELEROMETERS

Development of an electromyography and accelerometry ambulatory recording system [CERB-91-07] p 184 N92-19926

ACTIVITY (BIOLOGY)

Studies of the biological activity of a nidus vespaee extract in animals subjected to physical loads p 157 A92-26023

Characteristics of behavioral reactions of rats exposed to constant electric fields of different voltage p 157 A92-26024

ADAPTATION

Mechanisms of action of heavy metals and asbestos on cultured animal cells: Adaptation, transformation and progression [DE92-004101] p 160 N92-18887

ADJUSTING

The RAF Institute of Aviation Medicine proposed helmet fitting/retention system p 181 N92-19013

ADRENAL METABOLISM

Influences of chemical sympathectomy, demedullation, and hindlimb suspension on the V(O2)max of rats p 158 A92-26334

ADSORBENTS

An experimental study of the effect of high pressure on the adsorption properties of silochrome C-120 --- absorbent for air purification in hyperbaric environments p 177 A92-25269

AEROEMBOLISM

Altitude-induced arterial gas embolism - A case report p 165 A92-26336

Pathophysiology of spontaneous venous gas embolism [NASA-CR-189915] p 173 N92-19761

AEROSPACE MEDICINE

The effect of weightlessness on the progress of muscle repair in rats flown on the Cosmos-2044 biosatellite p 155 A92-25261

The effect of weightlessness on healing of bone fractures in rats flown on the Cosmos-2044 biosatellite p 155 A92-25262

Variations in the prostaglandin content and in some parameters of lipid metabolism in humans under conditions of prolonged hypokinesia p 162 A92-25263

Night-sleep pattern and the susceptibility to motion sickness p 163 A92-25274

Clinical aviation medicine (2nd revised and enlarged edition) --- Book [ISBN 0-8121-1248-2] p 165 A92-26700

High Altitude and High Acceleration Protection for Military Aircrew [AGARD-CP-516] p 168 N92-18972

Decompression sickness and ebullism at high altitudes p 169 N92-18973

Prebreathing as a means to decrease the incidence of decompression sickness at altitude p 169 N92-18976

Helmet Mounted Displays and Night Vision Goggles [AGARD-CP-517] p 181 N92-19008

Fixed wing night attack EO integration and sensor fusion p 181 N92-19009

AFFERENT NERVOUS SYSTEMS

The role of specific and nonspecific afferent systems in the mechanism of changes in cortical evoked responses to vibration p 158 A92-26025

AIR CONDITIONING

Effects of liquid desiccants on airborne microorganisms: Laboratory set up, procedure development, and preliminary measurements [DE92-004749] p 160 N92-19636

AIR DROP OPERATIONS

Use of air transport in delivering medical help to victims in the area of an earthquake epicenter p 163 A92-25956

AIR FLOW

Model of air flow in a multi-bladder physiological protection system p 180 N92-18997

AIR POLLUTION

Retention modeling of diesel exhaust particles in rats and humans [PB91-243238] p 173 N92-19954

AIR PURIFICATION

An experimental study of the effect of high pressure on the adsorption properties of silochrome C-120 --- absorbent for air purification in hyperbaric environments p 177 A92-25269

Biocatalysis using immobilized cells or enzymes as a method of water and air purification in a hermetically sealed habitat p 177 A92-26016

AIRBORNE INFECTION

Effects of liquid desiccants on airborne microorganisms: Laboratory set up, procedure development, and preliminary measurements [DE92-004749] p 160 N92-19636

AIRCRAFT ACCIDENT INVESTIGATION

G-induced loss of consciousness accidents: USAF experience 1982-1990 p 169 N92-18977

AIRCRAFT ACCIDENTS

Psychophysiological training of multisite-aircraft flight personnel for coordinating activities during emergency situations p 167 A92-27642

AIRCRAFT INSTRUMENTS

Design of helicopter night pilotage sensors: Lessons learned from recent flight experiments and field assessments p 183 N92-19020

AIRCRAFT MAINTENANCE

Human factors in aviation maintenance, phase 1 [AD-A243844] p 184 N92-19808

AIRCRAFT PILOTS

Functional state of the cardiovascular system in fighter pilots with mitral valve prolapse p 161 A92-25252

ALBUMINS

- Some characteristics of humoral immunity and nonspecific resistance in pilots p 161 A92-25255
- A model of the pilot's perception of the perturbed angular motion of the cockpit as part of the pilot's information model p 177 A92-26007
- Psychophysiological training of multisite-aircraft flight personnel for coordinating activities during emergency situations p 167 A92-27642
- G-induced loss of consciousness accidents: USAF experience 1982-1990 p 169 N92-18977
- An evaluation of the protective integrated hood mask for ANVIS night vision goggle compatibility p 181 N92-19012

ALBUMINS

- Functional properties of blood proteins in highly trained athletes p 162 A92-25258

ALTITUDE ACCLIMATIZATION

- The characteristics of structural changes in membranes of the rectum of animals in the process of adaptation to high altitude p 159 A92-27635

ALTITUDE SICKNESS

- Altitude-induced arterial gas embolism - A case report p 165 A92-26336

ALVEOLAR AIR

- Pathophysiology of spontaneous venous gas embolism [NASA-CR-189915] p 173 N92-19761

ALVEOLI

- Retention modeling of diesel exhaust particles in rats and humans [PB91-243238] p 173 N92-19954
- Development of a lung-cell model for studying workplace genotoxicants [PB92-114644] p 174 N92-20020

AMINO ACIDS

- On the transition period from chemical to biological evolution [DE92-609049] p 159 N92-18132

ANGULAR ACCELERATION

- A kinematic model for predicting the effects of helmet mounted systems p 182 N92-19015

ANIMALS

- Mechanisms of action of heavy metals and asbestos on cultured animal cells: Adaptation, transformation and progression [DE92-004101] p 160 N92-18887

ANTHROPOMETRY

- The design and development of a full-cover partial pressure assembly for protection against high altitude and G p 180 N92-18998

ANTIGRAVITY

- The optimisation of a positive pressure breathing system for enhanced G protection p 171 N92-18986
- Effects on Gz endurance/tolerance of reduced pressure schedules using the Advanced Technology Anti-G Suite (ATAGS) p 171 N92-18987
- Physiological protection equipment for combat aircraft: Integration of functions, principal technologies p 180 N92-18996
- Model of air flow in a multi-bladder physiological protection system p 180 N92-18997
- High altitude high acceleration and NBC warfare protective system for advanced fighter aircraft: Design considerations p 181 N92-19000

ANTIRADIATION DRUGS

- Protection from effects of radiation at sublethal doses during exposures to hypergravitation p 156 A92-25276
- Mechanisms for radiation damage in DNA [DE91-019080] p 167 N92-18025
- Mechanisms for radiation damage in DNA [DE91-019079] p 168 N92-18419

ANTISEPTICS

- Effects of liquid desiccants on airborne microorganisms: Laboratory set up, procedure development, and preliminary measurements [DE92-004749] p 160 N92-19636

ARCHAEBACTERIA

- Novel major archaeobacterial group from marine plankton p 159 A92-28236

ARCHITECTURE (COMPUTERS)

- Multidimensional signal coding in the visual system [AD-A244281] p 179 N92-18816

ARRHYTHMIA

- Effects of 4 percent and 6 percent carboxyhemoglobin on arrhythmia production in patients with coronary artery disease [PB91-243246] p 174 N92-19956

ASBESTOS

- Mechanisms of action of heavy metals and asbestos on cultured animal cells: Adaptation, transformation and progression [DE92-004101] p 160 N92-18887

ASCORBIC ACID METABOLISM

- The effect of the metabolic preparation Rikavit on the process of human adaptation to high altitudes p 166 A92-27499

ASTRONAUT PERFORMANCE

- Assessment of the health status and the characteristics of metabolism in cosmonauts during a prolonged space flight p 165 A92-26018

ASYMPTOTIC METHODS

- Global models for the biomechanics of green plants, part 2 [DE92-603590] p 160 N92-18757

ATROPHY

- Intermittent acceleration as a countermeasure to soleus muscle atrophy p 158 A92-26548

ATTACK AIRCRAFT

- French equipment for integrated protection of combat aircraft crews: Principles and tests at high altitudes p 180 N92-18994

ATTITUDE INDICATORS

- Attitude maintenance using an off-boresight helmet-mounted virtual display p 183 N92-19022

AUDITORY SIGNALS

- Binaural masking: An analysis of models [AD-A244392] p 168 N92-18859

AUDITORY STIMULI

- Attention, imagery and memory: A neuromagnetic investigation [AD-A243859] p 175 N92-19069

AUTONOMIC NERVOUS SYSTEM

- Role of external respiration in the formation of the autonomic component of motion sickness p 162 A92-25260
- The effects of exercise on pharmacokinetics and pharmacodynamics of physostigmine in rats [AD-A241867] p 159 N92-18257

AVIATION PSYCHOLOGY

- Psychophysiological training of multisite-aircraft flight personnel for coordinating activities during emergency situations p 167 A92-27642

B

BACTERIA

- A method for a comprehensive assessment of technical equipment for the medical compartment of a spacecraft p 177 A92-26019
- Phylogenetic relationships among subsurface microorganisms [DE92-004421] p 159 N92-18113

BINAURAL HEARING

- Binaural masking: An analysis of models [AD-A244392] p 168 N92-18859

BINOCULAR VISION

- The effects upon visual performance of varying binocular overlap p 182 N92-19016
- Does the future lie in binocular helmet display? p 183 N92-19019

BIOASSAY

- Mechanisms of action of heavy metals and asbestos on cultured animal cells: Adaptation, transformation and progression [DE92-004101] p 160 N92-18887
- Development of a lung-cell model for studying workplace genotoxicants [PB92-114644] p 174 N92-20020

BIOASTRONAUTICS

- The effect of weightlessness on healing of bone fractures in rats flown on the Cosmos-2044 biosatellite p 155 A92-25262

BIOCHEMISTRY

- Changes in the erythrocyte membranes and of Na(+), K(+)-ATPase in participants of the Canadian-Soviet trans-Arctic ski trek p 162 A92-25257
- Prophylactic and sensitizing effects of biologically active substances in the simulation of vestibulovegetative disorders p 156 A92-25275
- Assessment of the health status and the characteristics of metabolism in cosmonauts during a prolonged space flight p 165 A92-26018
- Studies of the biological activity of a nidus vespaee extract in animals subjected to physical loads p 157 A92-26023
- Content and composition of free fatty acids in the sarcoplasmic reticulum membranes after exposure to ionizing radiation p 159 A92-28370
- The effects of exercise on pharmacokinetics and pharmacodynamics of physostigmine in rats [AD-A241867] p 159 N92-18257

BIODYNAMICS

- Global models for the biomechanics of green plants, part 2 [DE92-603590] p 160 N92-18757

- Global models for the biomechanics of green plants, part 3 [DE92-603591] p 160 N92-18758
- Design methodology for a helmet display: Ergonomic aspects p 183 N92-19023

BIOELECTRICITY

- The role of specific and nonspecific afferent systems in the mechanism of changes in cortical evoked responses to vibration p 158 A92-26025

BIOGEOCHEMISTRY

- Phylogenetic relationships among subsurface microorganisms [DE92-004421] p 159 N92-18113

BIOLOGICAL EFFECTS

- Basic approaches to spacecraft studies of the biological effect of heavy ions of galactic cosmic rays p 157 A92-26021
- Mechanisms for radiation damage in DNA [DE91-019080] p 167 N92-18025
- The molecular basis for UV response of cultured human cells [DE92-003766] p 167 N92-18296
- Mechanisms of action of heavy metals and asbestos on cultured animal cells: Adaptation, transformation and progression [DE92-004101] p 160 N92-18887

BIOLOGICAL EVOLUTION

- Novel major archaeobacterial group from marine plankton p 159 A92-28236
- On the transition period from chemical to biological evolution [DE92-609049] p 159 N92-18132

BIOLOGICAL MODELS (MATHEMATICS)

- Investigation of the cyclic kinetics of immunity by mathematical modeling methods p 156 A92-25271
- A mathematical approach to the assessment of the accuracy of physiological parameter measurements performed by different methods p 157 A92-26020

BIOMAGNETISM

- Attention, imagery and memory: A neuromagnetic investigation [AD-A243859] p 175 N92-19069

BIOSYNTHESIS

- Regulation of brain muscarinic receptors by protein kinase C [AD-A244419] p 172 N92-19087

BIOTECHNOLOGY

- Pileate mushrooms and algae - Objects for space biology --- Russian book p 156 A92-25402

BLACKOUT PREVENTION

- Subjective reports concerning assisted positive pressure breathing under high sustained acceleration p 170 N92-18983

BLOOD

- Pulse oximetry: Theoretical and experimental models [OUEL-1885/91] p 168 N92-18339

BLOOD CIRCULATION

- Functional properties of blood proteins in highly trained athletes p 162 A92-25258
- A cardiovascular model of G-stress effects: Preliminary studies with positive pressure breathing p 171 N92-18989
- Effects of 4 percent and 6 percent carboxyhemoglobin on arrhythmia production in patients with coronary artery disease [PB91-243246] p 174 N92-19956
- G-LOC, Gz and brain hypoxia. Gz/s and intracranial hypertension p 170 N92-18984
- Circulatory biomechanics effects of accelerations p 171 N92-18991

BLOOD PLASMA

- Tolerance to chest-to-back (+Gx) and head-to-feet (+Gz) overloads during drug-induced hypohydration p 161 A92-25253
- The grooming and motor activities of rats under conditions of hyperbaria p 157 A92-26012
- Analysis of the protein content in blood plasma of rats after their flight aboard the biosatellite Cosmos-1887, using two-dimensional electrophoresis p 157 A92-26022
- Bubble nucleation threshold in decompartmented plasma p 160 N92-18974

BLOOD PRESSURE

- Pulse oximetry: Theoretical and experimental models [OUEL-1885/91] p 168 N92-18339
- G-induced loss of consciousness accidents: USAF experience 1982-1990 p 169 N92-18977
- Pulmonary effects of high-G and positive pressure breathing p 169 N92-18978
- The Valsalva maneuver and its limited value in predicting +Gz-tolerance p 170 N92-18981
- Hemodynamic responses to pressure breathing during +Gz (PBG) in swine p 160 N92-18982
- The optimisation of a positive pressure breathing system for enhanced G protection p 171 N92-18986

BLOOD VESSELS

Responses of the regional vessel tonus to the effects of orthostatic and gravitational loads p 161 A92-25254

Dynamics of kidney tissue and vessel changes in white rats due to acute cold stress p 158 A92-27600

BODY FLUIDS

Decompression sickness and ebullism at high altitudes p 169 N92-18973

BODY TEMPERATURE

Physiological-hygienic aspects of increasing the heat resistance in humans (Review of the literature) p 161 A92-25251

Temperature and humidity within the clothing microenvironment p 177 A92-26333

Thermal responses during extended water immersion: Comparisons of rest and exercise, and levels of immersion [AD-A244305] p 172 N92-19031

BOILING

Decompression sickness and ebullism at high altitudes p 169 N92-18973

BONE MINERAL CONTENT

The effect of weightlessness on healing of bone fractures in rats flown on the Cosmos-2044 biosatellite p 155 A92-25262

BORESIGHTS

Attitude maintenance using an off-boresight helmet-mounted virtual display p 183 N92-19022

BRAIN

The effects of exercise on pharmacokinetics and pharmacodynamics of physostigmine in rats [AD-A241867] p 159 N92-18257

BRAIN CIRCULATION

G-LOC, Gz and brain hypoxia, Gz/s and intracranial hypertension p 170 N92-18984

BREATHING APPARATUS

The optimisation of a positive pressure breathing system for enhanced G protection p 171 N92-18986

Physiological protection equipment for combat aircraft: Integration of functions, principal technologies p 180 N92-18996

The design and development of a full-cover partial pressure assembly for protection against high altitude and G p 180 N92-18998

Advances in the design of military aircrew breathing systems with respect to high altitude and high acceleration conditions p 180 N92-18999

High altitude high acceleration and NBC warfare protective system for advanced fighter aircraft: Design considerations p 181 N92-19000

BUBBLES

Bubble nucleation threshold in deoxygenated plasma p 160 N92-18974

BUFFERS (CHEMISTRY)

Emergency deposition of calcium by plasma and nonplasma buffer systems - The effect of long-term hypokinesia p 162 A92-25264

C**CABIN ATMOSPHERES**

A method for a comprehensive assessment of technical equipment for the medical compartment of a spacecraft p 177 A92-26019

CADMIUM

Mechanisms of action of heavy metals and asbestos on cultured animal cells: Adaptation, transformation and progression [DE92-004101] p 160 N92-18887

CALCIUM METABOLISM

Emergency deposition of calcium by plasma and nonplasma buffer systems - The effect of long-term hypokinesia p 162 A92-25264

The effect of a pulsed electromagnetic field on the accumulation of calcium ions by the sarcoplasmic reticulum of rat heart muscle p 156 A92-25270

A method for determining levels of calcium in the hand using activated neutrons from (Pu-238)-Be sources p 177 A92-25273

CARBOHYDRATE METABOLISM

Metabolic changes during hyperbaric oxygenation p 164 A92-26011

CARBON MONOXIDE

Effects of 4 percent and 6 percent carboxyhemoglobin on arrhythmia production in patients with coronary artery disease [PB91-243246] p 174 N92-19956

CARBOXYHEMOGLOBIN

Effects of 4 percent and 6 percent carboxyhemoglobin on arrhythmia production in patients with coronary artery disease [PB91-243246] p 174 N92-19956

CARCINOGENS

The molecular basis for UV response of cultured human cells [DE92-003766] p 167 N92-18296

CARDIOVASCULAR SYSTEM

Functional state of the cardiovascular system in fighter pilots with mitral valve prolapse p 161 A92-25252

Functional changes in the cardiovascular system and their pharmacological correction during immersion in a diving suit p 164 A92-26013

The Valsalva maneuver and its limited value in predicting +Gz-tolerance p 170 N92-18981

Hemodynamic responses to pressure breathing during +Gz (PBG) in swine p 160 N92-18982

Assessment of physiological requirements for protection of the human cardiovascular system against high sustained gravitational stresses p 171 N92-18990

Pathophysiology of spontaneous venous gas embolism [NASA-CR-189915] p 173 N92-19761

CATHODE RAY TUBES

Helicopter integrated helmet requirements and test results p 181 N92-19011

CELL MEMBRANES (BIOLOGY)

Changes in the erythrocyte membranes and of Na(+), K(+)-ATPase in participants of the Canadian-Soviet trans-Arctic ski trek p 162 A92-25257

The characteristics of structural changes in membranes of the rectum of animals in the process of adaptation to high altitude p 159 A92-27635

Content and composition of free fatty acids in the sarcoplasmic reticulum membranes after exposure to ionizing radiation p 159 A92-28370

CELLS (BIOLOGY)

Biocatalysis using immobilized cells or enzymes as a method of water and air purification in a hermetically sealed habitat p 177 A92-26016

Effects of a simulated microgravity model on cell structure and function in rat testis and epididymis p 158 A92-26549

Ultrastructural organization of chlorella cells cultivated on a solid medium in microgravity p 177 A92-26384

The molecular basis for UV response of cultured human cells [DE92-003766] p 167 N92-18296

Mechanisms of action of heavy metals and asbestos on cultured animal cells: Adaptation, transformation and progression [DE92-004101] p 160 N92-18887

Development of a lung-cell model for studying workplace genotoxins [PB92-114644] p 174 N92-20020

CENTRAL NERVOUS SYSTEM

Functional state of the CNS at an early period of the development of radiation sickness after irradiation with helium ions p 155 A92-25267

Assessment of physiological requirements for protection of the human cardiovascular system against high sustained gravitational stresses p 171 N92-18990

CENTRIFUGING STRESS

Functional state of the cardiovascular system in fighter pilots with mitral valve prolapse p 161 A92-25252

Intermittent acceleration as a countermeasure to soleus muscle atrophy p 158 A92-26548

CEREBRAL CORTEX

The role of specific and nonspecific afferent systems in the mechanism of changes in cortical evoked responses to vibration p 158 A92-26025

Regulation of brain muscarinic receptors by protein kinase C [AD-A244419] p 172 N92-19087

CHARGE TRANSFER

Mechanisms for radiation damage in DNA [DE91-019080] p 167 N92-18025

CHEMICAL COMPOUNDS

Chemical hazards database and detection system for Microgravity and Materials Processing Facility (MMPF) [NASA-CR-184274] p 179 N92-18927

CHEMICAL EFFECTS

Mechanisms for radiation damage in DNA [DE91-019080] p 167 N92-18025

CHEMICAL EVOLUTION

On the transition period from chemical to biological evolution [DE92-609049] p 159 N92-18132

CHEMICAL WARFARE

High altitude high acceleration and NBC warfare protective system for advanced fighter aircraft: Design considerations p 181 N92-19000

CHEMILUMINESCENCE

Noninvasive determination of respiratory ozone absorption: Development of a fast-responding ozone analyzer [PB91-243220] p 173 N92-19952

CHEMORECEPTORS

Regulation of brain muscarinic receptors by protein kinase C [AD-A244419] p 172 N92-19087

CHEMOTHERAPY

Radiopharmaceuticals for diagnosis and treatment [DE92-004065] p 167 N92-18102

CHLORELLA

Ultrastructural organization of chlorella cells cultivated on a solid medium in microgravity p 159 A92-28384

CHOLINESTERASE

The effects of exercise on pharmacokinetics and pharmacodynamics of physostigmine in rats [AD-A241867] p 159 N92-18257

CHROMOSOMES

Mechanisms for radiation damage in DNA [DE91-019079] p 168 N92-18419

CHRONIC CONDITIONS

Mechanisms of action of heavy metals and asbestos on cultured animal cells: Adaptation, transformation and progression [DE92-004101] p 160 N92-18887

CIRCADIAN RHYTHMS

Biorhythmicity in decompression sickness p 163 A92-25957

Crew factors in flight operations. 8: Factors influencing sleep timing and subjective sleep quality in commercial long-haul flight crews [NASA-TM-103852] p 174 N92-19977

CIRCUITS

Behavior and learning in networks with differing amounts of structure [AD-A244080] p 176 N92-19083

CIVIL AVIATION

Decompression sickness - An increasing risk for the private pilot p 165 A92-26335

CLINICAL MEDICINE

Emergency deposition of calcium by plasma and nonplasma buffer systems - The effect of long-term hypokinesia p 162 A92-25264

The effects of isolated and combined exposures to a constant magnetic field and antithrostatic hypokinesia on the central hemodynamics in rats p 156 A92-25268

A method for determining levels of calcium in the hand using activated neutrons from (Pu-238)-Be sources p 177 A92-25273

Altitude-induced arterial gas embolism - A case report p 165 A92-26336

Clinical aviation medicine (2nd revised and enlarged edition) --- Book [ISBN 0-8121-1248-2] p 165 A92-26700

Decompression sickness and ebullism at high altitudes p 169 N92-18973

CLOSED ECOLOGICAL SYSTEMS

Two different approaches for control and measurement of plant functions in closed environmental chambers [PB92-108067] p 161 N92-19911

COCKPITS

A model of the pilot's perception of the perturbed angular motion of the cockpit as part of the pilot's information model p 177 A92-26007

Aircrew tasks and cognitive complexity [ARL-SYS-TM-150] p 178 N92-18051

COGNITION

Aircrew tasks and cognitive complexity [ARL-SYS-TM-150] p 178 N92-18051

Individual difference effects in human-computer interaction [AD-A243172] p 179 N92-18516

Attention, imagery and memory: A neuromagnetic investigation [AD-A243859] p 175 N92-19069

Response devices and cognitive tasks [AD-A243903] p 176 N92-19365

COGNITIVE PSYCHOLOGY

Response devices and cognitive tasks [AD-A243903] p 176 N92-19365

COLD ACCLIMATIZATION

Changes in the erythrocyte membranes and of Na(+), K(+)-ATPase in participants of the Canadian-Soviet trans-Arctic ski trek p 162 A92-25257

COLD TOLERANCE

Dynamics of kidney tissue and vessel changes in white rats due to acute cold stress p 158 A92-27600

COLOR VISION

Multidimensional signal coding in the visual system [AD-A244281] p 179 N92-18816

COLUMBUS SPACE STATION

Arm of the future --- for space station robotics p 178 N92-27373

COMBAT

A management proposal for determining the effects of combat stress on the man-machine interface of complex information display systems [AD-A243422] p 178 N92-18080

- The effect of field-of-view size on performance of a simulated air-to-ground night attack p 182 N92-19018
- COMPATIBILITY**
An evaluation of the protective integrated hood mask for ANVIS night vision goggle compatibility p 181 N92-19012
- COMPUTER AIDED DESIGN**
Design methodology for a helmet display: Ergonomic aspects p 183 N92-19023
Application of finite element modeling and analysis to the design of positive pressure oxygen masks [AD-A244045] p 184 N92-19179
- COMPUTER AIDED TOMOGRAPHY**
Effect of increased axial field of view on the performance of a volume PET scanner [DE92-004424] p 173 N92-19877
- COMPUTER ASSISTED INSTRUCTION**
Characterization of Air Force training and computer-based training systems [AD-A243781] p 176 N92-19364
- COMPUTER NETWORKS**
Behavior and learning in networks with differing amounts of structure [AD-A244080] p 176 N92-19083
- COMPUTER PROGRAMS**
Development of a revised mathematical model of the gastrointestinal tract [DE92-004748] p 168 N92-18598
Application of finite element modeling and analysis to the design of positive pressure oxygen masks [AD-A244045] p 184 N92-19179
- COMPUTER TECHNIQUES**
Automated protocol analysis: Tools and methodology [AD-A242040] p 175 N92-18245
- COMPUTER VISION**
Behavior and learning in networks with differing amounts of structure [AD-A244080] p 176 N92-19083
- COMPUTERIZED SIMULATION**
External respiration and gas exchange in humans undergoing simulated diving at 350 m p 164 A92-26009
Computer simulation model of cockpit crew coordination: A crew-level error model for the US Army's Blackhawk helicopter [AD-A243618] p 178 N92-18009
Model of air flow in a multi-bladder physiological protection system p 180 N92-18997
- CONDITIONED REFLEXES**
Characteristics of behavioral reactions of rats exposed to constant electric fields of different voltage p 157 A92-26024
- CONFERENCES**
High Altitude and High Acceleration Protection for Military Aircrew [AGARD-CP-516] p 168 N92-18972
Helmet Mounted Displays and Night Vision Goggles [AGARD-CP-517] p 181 N92-19008
- CONTROL SYSTEMS DESIGN**
Supervisory telerobotics testbed for unstructured environments p 178 A92-26660
- COORDINATION**
Restriction of the field of vision: Influence on eye-head coordination during orientation towards an eccentric target p 182 N92-19017
- CORONARY ARTERY DISEASE**
Effects of 4 percent and 6 percent carboxyhemoglobin on arrhythmia production in patients with coronary artery disease [PB91-243246] p 174 N92-19956
- CORONARY CIRCULATION**
Assessment of physiological requirements for protection of the human cardiovascular system against high sustained gravitational stresses p 171 N92-18990
- CRANIUM**
G-LOC, Gz and brain hypoxia. Gz/s and intracranial hypertension p 170 N92-18984
- CROP GROWTH**
Two different approaches for control and measurement of plant functions in closed environmental chambers [PB92-108067] p 161 N92-19911
- CRYSTAL GROWTH**
The solubility of the tetragonal form of hen egg white lysozyme from pH 4.0 to 5.4 p 157 A92-25429

D

- DAMAGE**
Evaluating the human health effects of hazardous wastes: Reproduction and development, neurotoxicity, genetic toxicity, and cancer [PB92-110352] p 173 N92-19702

DATA BASES

- Chemical hazards database and detection system for Microgravity and Materials Processing Facility (MMPF) [NASA-CR-184274] p 179 N92-18927
Prebreathing as a means to decrease the incidence of decompression sickness at altitude p 169 N92-18976
PILOTS: User's guide [PB92-100262] p 173 N92-19689
- DECISION MAKING**
Characterization of Air Force training and computer-based training systems [AD-A243781] p 176 N92-19364
- DECOMPRESSION SICKNESS**
Biorhythmicity in decompression sickness p 163 A92-25957
The development of decompression regimens for excursion dives using data from prolonged exposures to 21 ata p 164 A92-26010
Decompression sickness - An increasing risk for the private pilot p 165 A92-26335
Altitude-induced arterial gas embolism - A case report p 165 A92-26336
High Altitude and High Acceleration Protection for Military Aircrew [AGARD-CP-516] p 168 N92-18972
Decompression sickness and ebullism at high altitudes p 169 N92-18973
Bubble nucleation threshold in decomplemented plasma p 160 N92-18974
The 1990 Hypobaric Decompression Sickness Workshop: Summary and Conclusions p 169 N92-18975
Prebreathing as a means to decrease the incidence of decompression sickness at altitude p 169 N92-18976
The experimental assessment of new partial pressure assemblies p 180 N92-18995
- DEEP WATER**
Microbiological aspects of the environment of underwater habitats p 177 A92-26008
- DEHYDRATION**
Tolerance to chest-to-back (+Gx) and head-to-feet (+Gz) overloads during drug-induced hypohydration p 161 A92-25253
Global models for the biomechanics of green plants, part 3 [DE92-603591] p 160 N92-18758
- DENITROGENATION**
Prebreathing as a means to decrease the incidence of decompression sickness at altitude p 169 N92-18976
- DEOXYRIBONUCLEIC ACID**
Mechanisms for radiation damage in DNA [DE91-019080] p 167 N92-18025
Phylogenetic relationships among subsurface microorganisms [DE92-004421] p 159 N92-18113
Mechanisms for radiation damage in DNA [DE91-019079] p 168 N92-18419
Development of a lung-cell model for studying workplace genotoxins [PB92-114644] p 174 N92-20020
- DESICCANTS**
Effects of liquid desiccants on airborne microorganisms: Laboratory set up, procedure development, and preliminary measurements [DE92-004749] p 160 N92-19636
- DESIGN ANALYSIS**
The design and evaluation of fast-jet helmet mounted displays p 181 N92-19010
- DETECTION**
Technology assessment and strategy for development of a rapid field water microbiology test kit [AD-A243413] p 167 N92-18076
Comparison of second and third generation night vision goggles in time-limited scenarios [AD-A244330] p 184 N92-19447
- DIAGNOSIS**
Radiopharmaceuticals for diagnosis and treatment [DE92-004065] p 167 N92-18102
Prebreathing as a means to decrease the incidence of decompression sickness at altitude p 169 N92-18976
- DIGESTIVE SYSTEM**
Some characteristics of the motor function of digestive organs in humans with different susceptibilities to motion sickness p 164 A92-26014
- DISPLAY DEVICES**
Aircrew tasks and cognitive complexity [ARL-SYS-TM-150] p 178 N92-18051
A management proposal for determining the effects of combat stress on the man-machine interface of complex information display systems [AD-A243422] p 178 N92-18080
Helmet mounted displays: Human factors and fidelity p 183 N92-19021
Attitude maintenance using an off-boresight helmet-mounted virtual display p 183 N92-19022

DIVING (UNDERWATER)

- Biorhythmicity in decompression sickness p 163 A92-25957
External respiration and gas exchange in humans undergoing simulated diving at 350 m p 164 A92-26009
The development of decompression regimens for excursion dives using data from prolonged exposures to 21 ata p 164 A92-26010
- DOSIMETERS**
Ionizing radiation risk assessment, BEIR 4 [DE92-004014] p 172 N92-19273
- DROSOPHILA**
Tyrosine hydroxylase activity in *Drosophila virilis* under normal conditions and heat stress p 158 A92-27494
- DRUGS**
Radiopharmaceuticals for diagnosis and treatment [DE92-004065] p 167 N92-18102
- DUMMIES**
Horizontal impact tests of the Advanced Dynamic Anthropomorphic Manikin (ADAM) [AD-A243857] p 184 N92-19829

E

EAR

- The effect of various types of abnormalities of the cupuloendolymphatic system of the vestibular apparatus on the system's dynamic characteristics p 155 A92-25259

EARTHQUAKES

- Use of air transport in delivering medical help to victims in the area of an earthquake epicenter p 163 A92-25956

EDEMA

- The characteristics of structural changes in membranes of the rectum of animals in the process of adaptation to high altitude p 159 A92-27635

EDUCATION

- Characterization of Air Force training and computer-based training systems [AD-A243781] p 176 N92-19364

EFFERENT NERVOUS SYSTEMS

- The grooming and motor activities of rats under conditions of hyperbaria p 157 A92-26012
Some characteristics of the motor function of digestive organs in humans with different susceptibilities to motion sickness p 164 A92-26014

ELECTRIC FIELDS

- Characteristics of behavioral reactions of rats exposed to constant electric fields of different voltage p 157 A92-26024

ELECTRO-OPTICS

- Fixed wing night attack EO integration and sensor fusion p 181 N92-19009
Design of helicopter night pilotage sensors: Lessons learned from recent flight experiments and field assessments p 183 N92-19020

ELECTROMAGNETIC FIELDS

- The effect of a pulsed electromagnetic field on the accumulation of calcium ions by the sarcoplasmic reticulum of rat heart muscle p 156 A92-25270

ELECTROMYOGRAPHY

- The influence of high, sustained acceleration stress on electromyographic activity of the trunk and leg muscles p 170 N92-18980

- Development of an electromyography and accelerometer ambulatory recording system [CERB-91-07] p 184 N92-19926

ELECTRONIC EQUIPMENT TESTS

- Horizontal impact tests of the Advanced Dynamic Anthropomorphic Manikin (ADAM) [AD-A243857] p 184 N92-19829

ELECTROPHORESIS

- Analysis of the protein content in blood plasma of rats after their flight aboard the biosatellite Cosmos-1887, using two-dimensional electrophoresis p 157 A92-26022

EMERGENCIES

- Physiological requirements for partial pressure assemblies for altitude protection p 179 N92-18993

ENDOLYMPH

- The effect of various types of abnormalities of the cupuloendolymphatic system of the vestibular apparatus on the system's dynamic characteristics p 155 A92-25259

ENZYME ACTIVITY

- Regulation of brain muscarinic receptors by protein kinase C [AD-A244419] p 172 N92-19087

ENZYMES

- Bubble nucleation threshold in decomplemented plasma p 160 N92-18974

F

ERROR ANALYSIS

Computer simulation model of cockpit crew coordination:
A crew-level error model for the US Army's Blackhawk helicopter
[AD-A243618] p 178 N92-18009

ERYTHROCYTES

Changes in the erythrocyte membranes and of Na(+), K(+)-ATPase in participants of the Canadian-Soviet trans-Arctic ski trek p 162 A92-25257

ESOPHAGUS

Maximum intra-thoracic pressure with PBG and AGSM
[DCIEM-91-43] p 169 N92-18979

EVACUATING (TRANSPORTATION)

Use of air transport in delivering medical help to victims in the area of an earthquake epicenter p 163 A92-25956

EVALUATION

Comparison of second and third generation night vision goggles in time-limited scenarios
[AD-A244330] p 184 N92-19447

EVOKED RESPONSE (PSYCHOPHYSIOLOGY)

Characteristics of behavioral reactions of rats exposed to constant electric fields of different voltage p 157 A92-26024

The role of specific and nonspecific afferent systems in the mechanism of changes in cortical evoked responses to vibration p 158 A92-26025

EXERCISE PHYSIOLOGY

Functional properties of blood proteins in highly trained athletes p 162 A92-25258

The effects of exercise on pharmacokinetics and pharmacodynamics of physostigmine in rats
[AD-A241867] p 159 N92-18257

EXHAUST EMISSION

Retention modeling of diesel exhaust particles in rats and humans
[PB91-243238] p 173 N92-19954

EXHAUST GASES

Retention modeling of diesel exhaust particles in rats and humans
[PB91-243238] p 173 N92-19954

EXOLOGY

Pileate mushrooms and algae - Objects for space biology --- Russian book p 156 A92-25402

Hematologic indices in cosmonauts during a space flight p 163 A92-26006

Basic approaches to spacecraft studies of the biological effect of heavy ions of galactic cosmic rays p 157 A92-26021

Analysis of the protein content in blood plasma of rats after their flight aboard the biosatellite Cosmos-1887, using two-dimensional electrophoresis p 157 A92-26022

Ultrastructural organization of chlorella cells cultivated on a solid medium in microgravity p 159 A92-28384

EXPLOSIVE DECOMPRESSION

French equipment for integrated protection of combat aircraft crews: Principles and tests at high altitudes p 180 N92-18994

EXPOSURE

Mechanisms of action of heavy metals and asbestos on cultured animal cells: Adaptation, transformation and progression
[DE92-004101] p 160 N92-18887

The 1990 Hypobaric Decompression Sickness Workshop: Summary and Conclusions p 169 N92-18975

EXTRAVEHICULAR ACTIVITY

Arm of the future --- for space station robotics p 178 A92-27373

A method of evaluating efficiency during space-suited work in a neutral buoyancy environment
[NASA-TP-3153] p 184 N92-19772

EYE (ANATOMY)

The effects upon visual performance of varying binocular overlap p 182 N92-19016

EYE MOVEMENTS

Aircrew tasks and cognitive complexity
[ARL-SYS-TM-150] p 178 N92-18051

Multidimensional signal coding in the visual system
[AD-A244281] p 179 N92-18816

Restriction of the field of vision: Influence on eye-head coordination during orientation towards an eccentric target p 182 N92-19017

Measurement of sight direction in a centrifuge. Part 2: Eye movement
[REPT-1169/CEV/SE/LAMAS] p 172 N92-19255

Measurement of sight direction in a centrifuge. Part 1: Head movement
[REPT-1168/CEV/SE/LAMAS] p 173 N92-19347

FATIGUE (BIOLOGY)

Effects on Gz endurance/tolerance of reduced pressure schedules using the Advanced Technology Anti-G Suite (ATAGS) p 171 N92-18987
The Military Aircrew Head Support System (MAHSS) p 179 N92-18988

FATIGUE TESTS

A method of evaluating efficiency during space-suited work in a neutral buoyancy environment
[NASA-TP-3153] p 184 N92-19772

FATTY ACIDS

Content and composition of free fatty acids in the sarcoplasmic reticulum membranes after exposure to ionizing radiation p 159 A92-28370

FEET (ANATOMY)

Investigation of the effect of cooling the feet as a means of reducing thermal stress
[AD-A244264] p 172 N92-19333

FIELD OF VIEW

The effects upon visual performance of varying binocular overlap p 182 N92-19016

The effect of field-of-view size on performance of a simulated air-to-ground night attack p 182 N92-19018

Design of helicopter night pilotage sensors: Lessons learned from recent flight experiments and field assessments p 183 N92-19020

Attitude maintenance using an off-boresight helmet-mounted virtual display p 183 N92-19022

FINITE ELEMENT METHOD

Application of finite element modeling and analysis to the design of positive pressure oxygen masks
[AD-A244045] p 184 N92-19179

FITTING

The design and development of a full-cover partial pressure assembly for protection against high altitude and G p 180 N92-18998

The RAF Institute of Aviation Medicine proposed helmet fitting/retention system p 181 N92-19013

FLEXIBLE BODIES

Near-minimum-time control of a flexible manipulator p 178 A92-28150

FLIGHT CLOTHING

Model of air flow in a multi-bladder physiological protection system p 180 N92-18997

FLIGHT CONDITIONS

Psychophysiological training of multiseat-aircraft flight personnel for coordinating activities during emergency situations p 167 A92-27642

FLIGHT CREWS

Glycemia as a risk factor of reduced tolerance to hypoxic hypoxia in flight personnel p 162 A92-25256

Hematologic indices in cosmonauts during a space flight p 163 A92-26006

Computer simulation model of cockpit crew coordination: A crew-level error model for the US Army's Blackhawk helicopter
[AD-A243618] p 178 N92-18009

Aircrew tasks and cognitive complexity
[ARL-SYS-TM-150] p 178 N92-18051

High Altitude and High Acceleration Protection for Military Aircrew
[AGARD-CP-516] p 168 N92-18972

Decompression sickness and ebullism at high altitudes p 169 N92-18973

French equipment for integrated protection of combat aircraft crews: Principles and tests at high altitudes p 180 N92-18994

Physiological protection equipment for combat aircraft: Integration of functions, principal technologies p 180 N92-18996

Advances in the design of military aircrew breathing systems with respect to high altitude and high acceleration conditions p 180 N92-18999

Crew factors in flight operations. 8: Factors influencing sleep timing and subjective sleep quality in commercial long-haul flight crews p 174 N92-19977

[NASA-TM-103852] p 174 N92-19977

FLIGHT HAZARDS

Decompression sickness - An increasing risk for the private pilot p 165 A92-26335

FLIGHT OPERATIONS

Crew factors in flight operations. 8: Factors influencing sleep timing and subjective sleep quality in commercial long-haul flight crews p 174 N92-19977

[NASA-TM-103852] p 174 N92-19977

FLIGHT SAFETY

High altitude high acceleration and NBC warfare protective system for advanced fighter aircraft: Design considerations p 181 N92-19000

FLIGHT SIMULATION

External respiration and gas exchange during space flights p 163 A92-26004

Helmet mounted displays: Human factors and fidelity p 183 N92-19021

FLIGHT SIMULATORS

Measurement of sight direction in a centrifuge. Part 1: Head movement
[REPT-1168/CEV/SE/LAMAS] p 173 N92-19347

FLIGHT STRESS

Decompression sickness and ebullism at high altitudes p 169 N92-18973

Prebreathing as a means to decrease the incidence of decompression sickness at altitude p 169 N92-18976

FLIGHT STRESS (BIOLOGY)

Some characteristics of humoral immunity and nonspecific resistance in pilots p 161 A92-25255

Glycemia as a risk factor of reduced tolerance to hypoxic hypoxia in flight personnel p 162 A92-25256

Crew factors in flight operations. 8: Factors influencing sleep timing and subjective sleep quality in commercial long-haul flight crews p 174 N92-19977

[NASA-TM-103852] p 174 N92-19977

FLIR DETECTORS

Fixed wing night attack EO integration and sensor fusion p 181 N92-19009

The effect of field-of-view size on performance of a simulated air-to-ground night attack p 182 N92-19018

FLOW VELOCITY

Noninvasive determination of respiratory ozone absorption: Development of a fast-responding ozone analyzer
[PB91-243220] p 173 N92-19952

FLUID FLOW

Global models for the biomechanics of green plants, part 2 p 160 N92-18757

Global models for the biomechanics of green plants, part 3 p 160 N92-18758

[DE92-603590] p 160 N92-18758

FOURIER TRANSFORMATION

Global models for the biomechanics of green plants, part 2 p 160 N92-18757

[DE92-603590] p 160 N92-18757

FUNCTIONAL DESIGN SPECIFICATIONS

Design methodology for a helmet display: Ergonomic aspects p 183 N92-19023

G

GALACTIC COSMIC RAYS

Basic approaches to spacecraft studies of the biological effect of heavy ions of galactic cosmic rays p 157 A92-26021

GALVANIC SKIN RESPONSE

Phasic skin conductance activity and motion sickness p 165 A92-26329

GARMENTS

The design and development of a full-cover partial pressure assembly for protection against high altitude and G p 180 N92-18998

GAS CHROMATOGRAPHY

An experimental study of the effect of high pressure on the adsorption properties of silochrome C-120 --- absorbent for air purification in hyperbaric environments p 177 A92-25269

GAS COMPOSITION

Noninvasive determination of respiratory ozone absorption: Development of a fast-responding ozone analyzer
[PB91-243220] p 173 N92-19952

GAS EXCHANGE

Role of external respiration in the formation of the autonomic component of motion sickness p 162 A92-25260

External respiration and gas exchange during space flights p 163 A92-26004

External respiration and gas exchange in humans undergoing simulated diving at 350 m p 164 A92-26009

Pathophysiology of spontaneous venous gas embolism
[NASA-CR-189915] p 173 N92-19761

GASTROINTESTINAL SYSTEM

Development of a revised mathematical model of the gastrointestinal tract p 168 N92-18598

[DE92-004748] p 168 N92-18598

GENE EXPRESSION

The molecular basis for UV response of cultured human cells p 167 N92-18296

[DE92-003766] p 167 N92-18296

GENES

Tyrosine hydroxylase activity in Drosophila virilis under normal conditions and heat stress p 158 A92-27494

GENETIC ENGINEERING

Phylogenetic relationships among subsurface microorganisms p 159 N92-18113

[DE92-004421] p 159 N92-18113

GENETICS

- Mechanisms for radiation damage in DNA
[DE91-019079] p 168 N92-18419
- Evaluating the human health effects of hazardous wastes: Reproduction and development, neurotoxicity, genetic toxicity, and cancer
[PB92-110352] p 173 N92-19702
- Development of a lung-cell model for studying workplace genotoxicants
[PB92-114644] p 174 N92-20020

GLUCOSE

- Glycemia as a risk factor of reduced tolerance to hypoxic hypoxia in flight personnel p 162 A92-25256

GOGGLES

- Helmet Mounted Displays and Night Vision Goggles [AGARD-CP-517] p 181 N92-19008
- Fixed wing night attack EO integration and sensor fusion p 181 N92-19009
- An evaluation of the protective integrated hood mask for ANVIS night vision goggle compatibility p 181 N92-19012
- Comparison of second and third generation night vision goggles in time-limited scenarios
[AD-A244330] p 184 N92-19447

GRAMMARS

- Automated protocol analysis: Tools and methodology [AD-A242040] p 175 N92-18245

GRAVITATIONAL EFFECTS

- Protection from effects of radiation at sublethal doses during exposures to hypergravity p 156 A92-25276
- Pulmonary effects of high-G and positive pressure breathing p 169 N92-18978
- Effects on Gz endurance/tolerance of reduced pressure schedules using the Advanced Technology Anti-G Suite (ATAGS) p 171 N92-18987
- The Military Aircrew Head Support System (MAHSS) p 179 N92-18988
- Assessment of physiological requirements for protection of the human cardiovascular system against high sustained gravitational stresses p 171 N92-18990
- Finite element modeling of sustained +Gz acceleration induced stresses in the human ventricle myocardium p 172 N92-18992

GRAVITATIONAL PHYSIOLOGY

- Tolerance to chest-to-back (+Gx) and head-to-feet (+Gz) overloads during drug-induced hypohydration p 161 A92-25253
- Responses of the regional vessel tonus to the effects of orthostatic and gravitational loads p 161 A92-25254
- The effect of weightlessness on the progress of muscle repair in rats flown on the Cosmos-2044 biosatellite p 155 A92-25261
- The effect of weightlessness on healing of bone fractures in rats flown on the Cosmos-2044 biosatellite p 155 A92-25262
- G-endurance during heat stress and balanced pressure breathing p 165 A92-26331
- Intermittent acceleration as a countermeasure to soleus muscle atrophy p 158 A92-26548
- Effects of a simulated microgravity model on cell structure and function in rat testis and epididymis p 158 A92-26549
- Pulmonary effects of high-G and positive pressure breathing p 169 N92-18978
- Maximum intra-thoracic pressure with PBG and AGSM [DCIEM-91-43] p 169 N92-18979
- The influence of high, sustained acceleration stress on electromyographic activity of the trunk and leg muscles p 170 N92-18980
- The Valsalva maneuver and its limited value in predicting +Gz-tolerance p 170 N92-18981
- Hemodynamic responses to pressure breathing during +Gz (PBG) in swine p 160 N92-18982
- G-LOC, Gz and brain hypoxia. Gz/s and intracranial hypertension p 170 N92-18984
- Assisted positive pressure breathing: Effects on +Gz human tolerance in centrifuge p 170 N92-18985

GREENHOUSE EFFECT

- Two different approaches for control and measurement of plant functions in closed environmental chambers [PB92-108067] p 161 N92-19911

H

HAND (ANATOMY)

- A method for determining levels of calcium in the hand using activated neutrons from (Pu-238)-Be sources p 177 A92-25273

HARNESSES

- Horizontal impact tests of the Advanced Dynamic Anthropomorphic Manikin (ADAM)
[AD-A243857] p 184 N92-19829

HEAD DOWN TILT

- The effect of head-down tilt and water immersion on intracranial pressure in nonhuman primates p 158 A92-26332
- Influences of chemical sympathectomy, demedullation, and hindlimb suspension on the V(O2)max of rats p 158 A92-26334

HEAD MOVEMENT

- Biomechanical response of the head to G+ accelerations: Benefit for studies in combat simulators p 182 N92-19014
- Restriction of the field of vision: Influence on eye-head coordination during orientation towards an eccentric target p 182 N92-19017
- Measurement of sight direction in a centrifuge. Part 1: Head movement
[REPT-1168/CEV/SE/LAMAS] p 173 N92-19347

HEAD-UP DISPLAYS

- The effect of field-of-view size on performance of a simulated air-to-ground night attack p 182 N92-19018

HEALTH

- PILOTS: User's guide
[PB92-100262] p 173 N92-19689
- Evaluating the human health effects of hazardous wastes: Reproduction and development, neurotoxicity, genetic toxicity, and cancer
[PB92-110352] p 173 N92-19702

HEART

- Finite element modeling of sustained +Gz acceleration induced stresses in the human ventricle myocardium p 172 N92-18992

HEART FUNCTION

- The effect of a pulsed electromagnetic field on the accumulation of calcium ions by the sarcoplasmic reticulum of rat heart muscle p 156 A92-25270
- The Valsalva maneuver and its limited value in predicting +Gz-tolerance p 170 N92-18981

HEART RATE

- Functional state of the cardiovascular system in fighter pilots with mitral valve prolapse p 161 A92-25252
- A mathematical approach to the assessment of the accuracy of physiological parameter measurements performed by different methods p 157 A92-26020
- Assisted positive pressure breathing: Effects on +Gz human tolerance in centrifuge p 170 N92-18985
- A cardiovascular model of G-stress effects: Preliminary studies with positive pressure breathing p 171 N92-18989
- Circulatory biomechanics effects of accelerations p 171 N92-18991

HEAT ACCLIMATIZATION

- Physiological-hygienic aspects of increasing the heat resistance in humans (Review of the literature) p 161 A92-25251

HEAT TRANSFER

- Investigation of the effect of cooling the feet as a means of reducing thermal stress
[AD-A244264] p 172 N92-19333

HEAVY IONS

- Basic approaches to spacecraft studies of the biological effect of heavy ions of galactic cosmic rays p 157 A92-26021

HELICOPTER CONTROL

- Design of helicopter night pilotage sensors: Lessons learned from recent flight experiments and field assessments p 183 N92-19020

HELICOPTERS

- Helicopter integrated helmet requirements and test results p 181 N92-19011

HELIUM IONS

- Functional state of the CNS at an early period of the development of radiation sickness after irradiation with helium ions p 155 A92-25267

HELIUM-OXYGEN ATMOSPHERES

- External respiration and gas exchange in humans undergoing simulated diving at 350 m p 164 A92-26009

- The grooming and motor activities of rats under conditions of hyperbaria p 157 A92-26012

HELMET MOUNTED DISPLAYS

- Helmet Mounted Displays and Night Vision Goggles [AGARD-CP-517] p 181 N92-19008
- The design and evaluation of fast-jet helmet mounted displays p 181 N92-19010
- Helicopter integrated helmet requirements and test results p 181 N92-19011
- Biomechanical response of the head to G+ accelerations: Benefit for studies in combat simulators p 182 N92-19014
- A kinematic model for predicting the effects of helmet mounted systems p 182 N92-19015
- The effects upon visual performance of varying binocular overlap p 182 N92-19016
- The effect of field-of-view size on performance of a simulated air-to-ground night attack p 182 N92-19018

Does the future lie in binocular helmet display?

- p 183 N92-19019
- Design of helicopter night pilotage sensors: Lessons learned from recent flight experiments and field assessments p 183 N92-19020
- Helmet mounted displays: Human factors and fidelity p 183 N92-19021
- Attitude maintenance using an off-boresight helmet-mounted virtual display p 183 N92-19022
- Design methodology for a helmet display: Ergonomic aspects p 183 N92-19023
- Measurement of sight direction in a centrifuge. Part 2: Eye movement
[REPT-1169/CEV/SE/LAMAS] p 172 N92-19255
- Measurement of sight direction in a centrifuge. Part 1: Head movement
[REPT-1168/CEV/SE/LAMAS] p 173 N92-19347

HELMETS

- Fixed wing night attack EO integration and sensor fusion p 181 N92-19009
- The design and evaluation of fast-jet helmet mounted displays p 181 N92-19010
- Helicopter integrated helmet requirements and test results p 181 N92-19011
- The RAF Institute of Aviation Medicine proposed helmet fitting/retention system p 181 N92-19013
- Design methodology for a helmet display: Ergonomic aspects p 183 N92-19023

HEMATOLOGY

- Hematologic indices in cosmonauts during a space flight p 163 A92-26006

HEMODYNAMIC RESPONSES

- Responses of the regional vessel tonus to the effects of orthostatic and gravitational loads p 161 A92-25254
- The effects of isolated and combined exposures to a constant magnetic field and antiothostatic hypokinesia on the central hemodynamics in rats p 156 A92-25268
- The Valsalva maneuver and its limited value in predicting +Gz-tolerance p 170 N92-18981
- Hemodynamic responses to pressure breathing during +Gz (PBG) in swine p 160 N92-18982

HEMOGLOBIN

- Functional properties of blood proteins in highly trained athletes p 162 A92-25258

HERMES MANNED SPACEPLANE

- Arm of the future --- for space station robotics p 178 A92-27373

HIGH ACCELERATION

- High Altitude and High Acceleration Protection for Military Aircrew
[AGARD-CP-516] p 168 N92-18972
- The influence of high, sustained acceleration stress on electromyographic activity of the trunk and leg muscles p 170 N92-18980
- Subjective reports concerning assisted positive pressure breathing under high sustained acceleration p 170 N92-18983
- Advances in the design of military aircrew breathing systems with respect to high altitude and high acceleration conditions p 180 N92-18999
- High altitude high acceleration and NBC warfare protective system for advanced fighter aircraft: Design considerations p 181 N92-19000

HIGH ALTITUDE

- High Altitude and High Acceleration Protection for Military Aircrew
[AGARD-CP-516] p 168 N92-18972
- Physiological requirements for partial pressure assemblies for altitude protection p 179 N92-18993
- French equipment for integrated protection of combat aircraft crews: Principles and tests at high altitudes p 180 N92-18994
- The design and development of a full-cover partial pressure assembly for protection against high altitude and G p 180 N92-18998
- Advances in the design of military aircrew breathing systems with respect to high altitude and high acceleration conditions p 180 N92-18999
- High altitude high acceleration and NBC warfare protective system for advanced fighter aircraft: Design considerations p 181 N92-19000

HIGH ALTITUDE BREATHING

- Estimating the organism's nonspecific resistance from individual reaction to hypoxic testing p 166 A92-27498

HIGH ALTITUDE ENVIRONMENTS

- Estimating the organism's nonspecific resistance from individual reaction to hypoxic testing p 166 A92-27498
- The effect of the metabolic preparation Rikavit on the process of human adaptation to high altitudes p 166 A92-27499
- The characteristics of structural changes in membranes of the rectum of animals in the process of adaptation to high altitude p 159 A92-27635

HIGH ALTITUDE TESTS

The characteristics of structural changes in membranes of the rectum of animals in the process of adaptation to high altitude p 159 A92-27635

HIGH GRAVITY ENVIRONMENTS

Protection from effects of radiation at sublethal doses during exposures to hypergravitation p 156 A92-25276

HIGH PRESSURE

An experimental study of the effect of high pressure on the adsorption properties of silochrome C-120 --- absorbent for air purification in hyperbaric environments p 177 A92-25269

HORMONE METABOLISMS

The information content of some hormonal indices and cyclic nucleotides in the estimation and prediction of resistance to the effect of acute hypoxia in operators p 163 A92-25266

HUMAN BEINGS

External respiration and gas exchange in humans undergoing simulated diving at 350 m p 164 A92-26009

Metabolic changes during hyperbaric oxygenation p 164 A92-26011

HUMAN BODY

Physiological-hygienic aspects of increasing the heat resistance in humans (Review of the literature) p 161 A92-25251

HUMAN CENTRIFUGES

Assisted positive pressure breathing: Effects on +Gz human tolerance in centrifuge p 170 N92-18985

Biomechanical response of the head to G+ accelerations: Benefit for studies in combat simulators p 182 N92-19014

Measurement of sight direction in a centrifuge. Part 2: Eye movement [REPT-1169/CEV/SE/LAMAS] p 172 N92-19255

Measurement of sight direction in a centrifuge. Part 1: Head movement [REPT-1168/CEV/SE/LAMAS] p 173 N92-19347

HUMAN FACTORS ENGINEERING

Aircrew tasks and cognitive complexity [ARL-SYS-TM-150] p 178 N92-18051

Organizational aspects for preventing human faults in space systems: Systems engineering approaches to total quality management [MBB-UK-0139-91-PUB] p 179 N92-18481

Individual difference effects in human-computer interaction [AD-A243172] p 179 N92-18516

Helmet Mounted Displays and Night Vision Goggles [AGARD-CP-517] p 181 N92-19008

The design and evaluation of fast-jet helmet mounted displays p 181 N92-19010

The RAF Institute of Aviation Medicine proposed helmet fitting/retention system p 181 N92-19013

Helmet mounted displays: Human factors and fidelity p 183 N92-19021

Attitude maintenance using an off-boresight helmet-mounted virtual display p 183 N92-19022

Design methodology for a helmet display: Ergonomic aspects p 183 N92-19023

Human factors in aviation maintenance, phase 1 [AD-A243844] p 184 N92-19808

HUMAN PATHOLOGY

The effect of various types of abnormalities of the cupuloendolymphatic system of the vestibular apparatus on the system's dynamic characteristics p 155 A92-25259

HUMAN PERFORMANCE

Computer simulation model of cockpit crew coordination: A crew-level error model for the US Army's Blackhawk helicopter [AD-A243618] p 178 N92-18009

Aircrew tasks and cognitive complexity [ARL-SYS-TM-150] p 178 N92-18051

Organizational aspects for preventing human faults in space systems: Systems engineering approaches to total quality management [MBB-UK-0139-91-PUB] p 179 N92-18481

Human performance assessment methods [AGARD-AG-308] p 176 N92-20037

HUMAN REACTIONS

Estimating the organism's nonspecific resistance from individual reaction to hypoxic testing p 166 A92-27498

The effect of the metabolic preparation Rikavit on the process of human adaptation to high altitudes p 166 A92-27499

Dynamics of competing interaction between verbal and manual activities during adaptation and readaptation after transmeridional flight p 166 A92-27500

HUMIDITY

Temperature and humidity within the clothing microenvironment p 177 A92-26333

HYDROLYSIS

Regulation of brain muscarinic receptors by protein kinase C [AD-A244419] p 172 N92-19087

HYPERBARIC CHAMBERS

An experimental study of the effect of high pressure on the adsorption properties of silochrome C-120 --- absorbent for air purification in hyperbaric environments p 177 A92-25269

Microbiological aspects of the environment of underwater habitats p 177 A92-26008

Metabolic changes during hyperbaric oxygenation p 164 A92-26011

The grooming and motor activities of rats under conditions of hyperbaria p 157 A92-26012

Altitude-induced arterial gas embolism - A case report p 165 A92-26336

HYPERTENSION

G-LOC, Gz and brain hypoxia. Gz/s and intracranial hypertension p 170 N92-18984

HYPERVENTILATION

Hyperventilation --- Russian book [ISBN 5-02-005854-8] p 163 A92-25401

HYPOBARIC ATMOSPHERES

The 1990 Hypobaric Decompression Sickness Workshop: Summary and Conclusions p 169 N92-18975

HYPOKINESIA

Variations in the prostaglandin content and in some parameters of lipid metabolism in humans under conditions of prolonged hypokinesia p 162 A92-25263

Emergency deposition of calcium by plasma and nonplasma buffer systems - The effect of long-term hypokinesia p 162 A92-25264

Some indices of protein and nucleic acid metabolism in the lymphoid organs of rats subjected to hypokinesia and to vitamin-B1 deficiency p 155 A92-25265

The effects of isolated and combined exposures to a constant magnetic field and antithrostatic hypokinesia on the central hemodynamics in rats p 156 A92-25268

HYPOXIA

Glycemia as a risk factor of reduced tolerance to hypoxic hypoxia in flight personnel p 162 A92-25256

The information content of some hormonal indices and cyclic nucleotides in the estimation and prediction of resistance to the effect of acute hypoxia in operators p 163 A92-25266

Hyperventilation --- Russian book [ISBN 5-02-005854-8] p 163 A92-25401

Estimating the organism's nonspecific resistance from individual reaction to hypoxic testing p 166 A92-27498

The effect of the metabolic preparation Rikavit on the process of human adaptation to high altitudes p 166 A92-27499

G-LOC, Gz and brain hypoxia. Gz/s and intracranial hypertension p 170 N92-18984

Physiological requirements for partial pressure assemblies for altitude protection p 179 N92-18993

ILLUMINATING

An evaluation of the protective integrated hood mask for ANVIS night vision goggle compatibility p 181 N92-19012

IMAGE INTENSIFIERS

Helicopter integrated helmet requirements and test results p 181 N92-19011

Comparison of second and third generation night vision goggles in time-limited scenarios [AD-A244330] p 184 N92-19447

IMAGE PROCESSING

Multidimensional signal coding in the visual system [AD-A244281] p 179 N92-18816

Does the future lie in binocular helmet display? p 183 N92-19019

Effect of increased axial field of view on the performance of a volume PET scanner [DE92-004424] p 173 N92-19877

IMAGES

Effect of increased axial field of view on the performance of a volume PET scanner [DE92-004424] p 173 N92-19877

IMAGING TECHNIQUES

An evaluation of the protective integrated hood mask for ANVIS night vision goggle compatibility p 181 N92-19012

Comparison of second and third generation night vision goggles in time-limited scenarios [AD-A244330] p 184 N92-19447

IMMUNE SYSTEMS

Some characteristics of humoral immunity and nonspecific resistance in pilots p 161 A92-25255

Investigation of the cyclic kinetics of immunity by mathematical modeling methods p 156 A92-25271

Some characteristics of the motor function of digestive organs in humans with different susceptibilities to motion sickness p 164 A92-26014

IMPACT ACCELERATION

A kinematic model for predicting the effects of helmet mounted systems p 182 N92-19015

IMPACT TESTS

A kinematic model for predicting the effects of helmet mounted systems p 182 N92-19015

Horizontal impact tests of the Advanced Dynamic Anthropomorphic Manikin (ADAM) [AD-A243857] p 184 N92-19829

INDOOR AIR POLLUTION

Effects of liquid desiccants on airborne microorganisms: Laboratory set up, procedure development, and preliminary measurements [DE92-004749] p 160 N92-19636

INFECTIOUS DISEASES

Nuclease activity of microorganisms and the problem of monitoring the state of automicroflora in operators in hermetically sealed environments p 164 A92-26015

INFLATABLE STRUCTURES

Model of air flow in a multi-bladder physiological protection system p 180 N92-18997

INFORMATION PROCESSING (BIOLOGY)

Does the future lie in binocular helmet display? p 183 N92-19019

Activity-driven CNS changes in learning and development [AD-A243790] p 175 N92-19064

INFORMATION RETRIEVAL

PILOTS: User's guide [PB92-100262] p 173 N92-19689

INFORMATION SYSTEMS

A management proposal for determining the effects of combat stress on the man-machine interface of complex information display systems [AD-A243422] p 178 N92-18080

INGESTION (BIOLOGY)

Development of a revised mathematical model of the gastrointestinal tract [DE92-004748] p 168 N92-18598

INJURIES

Finite element modeling of sustained +Gz acceleration induced stresses in the human ventricle myocardium p 172 N92-18992

INTRACRANIAL PRESSURE

The effect of head-down tilt and water immersion on intracranial pressure in nonhuman primates p 158 A92-26332

IONIZING RADIATION

Content and composition of free fatty acids in the sarcoplasmic reticulum membranes after exposure to ionizing radiation p 159 A92-28370

Ionizing radiation risk assessment, BEIR 4 [DE92-004014] p 172 N92-19273

ISOTOPIC LABELING

Radiopharmaceuticals for diagnosis and treatment [DE92-004065] p 167 N92-18102

K**KIDNEYS**

Dynamics of kidney tissue and vessel changes in white rats due to acute cold stress p 158 A92-27600

KITS

Technology assessment and strategy for development of a rapid field water microbiology test kit [AD-A243413] p 167 N92-18076

L**LAPLACE TRANSFORMATION**

Global models for the biomechanics of green plants, part 3 [DE92-603591] p 160 N92-18758

LEAD (METAL)

Mechanisms of action of heavy metals and asbestos on cultured animal cells: Adaptation, transformation and progression [DE92-004101] p 160 N92-18887

LEARNING

Activity-driven CNS changes in learning and development [AD-A243790] p 175 N92-19064

Receptor subtype alterations: Bases of neuronal plasticity and learning [AD-A244406] p 176 N92-19799

LEG (ANATOMY)

The influence of high, sustained acceleration stress on electromyographic activity of the trunk and leg muscles p 170 N92-18980

LIFE SUPPORT SYSTEMS

Biocatalysis using immobilized cells or enzymes as a method of water and air purification in a hermetically sealed habitat p 177 A92-26016

LIGHT TRANSMISSION

Pulse oximetry: Theoretical and experimental models [OUEL-1885/91] p 168 N92-18339

LIPID METABOLISM

Variations in the prostaglandin content and in some parameters of lipid metabolism in humans under conditions of prolonged hypokinesia p 162 A92-25263
Assessment of the health status and the characteristics of metabolism in cosmonauts during a prolonged space flight p 165 A92-26018

LIQUID COOLING

Investigation of the effect of cooling the feet as a means of reducing thermal stress [AD-A244264] p 172 N92-19333

LONG DURATION SPACE FLIGHT

Assessment of the health status and the characteristics of metabolism in cosmonauts during a prolonged space flight p 165 A92-26018

LONG TERM EFFECTS

The development of decompression regimens for excursion dives using data from prolonged exposures to 21 ata p 164 A92-26010

LYMPH

Retention modeling of diesel exhaust particles in rats and humans [PB91-243238] p 173 N92-19954

LYSOZYME

The solubility of the tetragonal form of hen egg white lysozyme from pH 4.0 to 5.4 p 157 A92-25429

M**MACHINE LEARNING**

Behavior and learning in networks with differing amounts of structure [AD-A244080] p 176 N92-19083

MACROMOLECULES

The solubility of the tetragonal form of hen egg white lysozyme from pH 4.0 to 5.4 p 157 A92-25429

MACROPHAGES

Development of a lung-cell model for studying workplace genotoxicants [PB92-114644] p 174 N92-20020

MAGNESIUM COMPOUNDS

Mechanisms of action of heavy metals and asbestos on cultured animal cells: Adaptation, transformation and progression [DE92-004101] p 160 N92-18887

MAGNETIC EFFECTS

The effects of isolated and combined exposures to a constant magnetic field and antihorostatic hypokinesia on the central hemodynamics in rats p 156 A92-25268

MAGNETIC FIELDS

Attention, imagery and memory: A neuromagnetic investigation [AD-A243859] p 175 N92-19069

MAN MACHINE SYSTEMS

A management proposal for determining the effects of combat stress on the man-machine interface of complex information display systems [AD-A243422] p 178 N92-18080
Helicopter integrated helmet requirements and test results p 181 N92-19011

MAN-COMPUTER INTERFACE

Automated protocol analysis: Tools and methodology [AD-A242040] p 175 N92-18245
Individual difference effects in human-computer interaction [AD-A243172] p 179 N92-18516

MANAGEMENT PLANNING

A management proposal for determining the effects of combat stress on the man-machine interface of complex information display systems [AD-A243422] p 178 N92-18080

MANIPULATORS

Supervisory telerobotics testbed for unstructured environments p 178 A92-26660

MANNED SPACE FLIGHT

External respiration and gas exchange during space flights p 163 A92-26004
Investigation of mental work capacity of cosmonauts aboard the Mir orbital complex p 175 A92-26005
Hematologic indices in cosmonauts during a space flight p 163 A92-26006
Biocatalysis using immobilized cells or enzymes as a method of water and air purification in a hermetically sealed habitat p 177 A92-26016
Assessment of the health status and the characteristics of metabolism in cosmonauts during a prolonged space flight p 165 A92-26018

A method for a comprehensive assessment of technical equipment for the medical compartment of a spacecraft p 177 A92-26019

Organizational aspects for preventing human faults in space systems: Systems engineering approaches to total quality management [MBB-UK-0139-91-PUB] p 179 N92-18481

MASKING

Binaural masking: An analysis of models [AD-A244392] p 168 N92-18859

MASKS

The optimisation of a positive pressure breathing system for enhanced G protection p 171 N92-18986
Physiological requirements for partial pressure assemblies for altitude protection p 179 N92-18993
An evaluation of the protective integrated hood mask for ANVIS night vision goggle compatibility p 181 N92-19012

MATERIALS HANDLING

Chemical hazards database and detection system for Microgravity and Materials Processing Facility (MMPF) [NASA-CR-184274] p 179 N92-18927

MATHEMATICAL MODELS

Development of a revised mathematical model of the gastrointestinal tract [DE92-004748] p 168 N92-18598

Binaural masking: An analysis of models [AD-A244392] p 168 N92-18859
A cardiovascular model of G-stress effects: Preliminary studies with positive pressure breathing p 171 N92-18989

Circulatory biomechanics effects of accelerations p 171 N92-18991

Finite element modeling of sustained +Gz acceleration induced stresses in the human ventricle myocardium p 172 N92-18992

A kinematic model for predicting the effects of helmet mounted systems p 182 N92-19015

Application of finite element modeling and analysis to the design of positive pressure oxygen masks [AD-A244045] p 184 N92-19179

Retention modeling of diesel exhaust particles in rats and humans [PB91-243238] p 173 N92-19954

MEASURING INSTRUMENTS

Measurement of sight direction in a centrifuge. Part 2: Eye movement [REPT-1169/CEV/SE/LAMAS] p 172 N92-19255

MEDICAL EQUIPMENT

A method for a comprehensive assessment of technical equipment for the medical compartment of a spacecraft p 177 A92-26019

MEDICAL SERVICES

PILOTS: User's guide [PB92-100262] p 173 N92-19689

MEMORY

Attention, imagery and memory: A neuromagnetic investigation [AD-A243859] p 175 N92-19069

Receptor subtype alterations: Bases of neuronal plasticity and learning [AD-A244406] p 176 N92-19799

MENTAL HEALTH

A management proposal for determining the effects of combat stress on the man-machine interface of complex information display systems [AD-A243422] p 178 N92-18080

MENTAL PERFORMANCE

Investigation of mental work capacity of cosmonauts aboard the Mir orbital complex p 175 A92-26005

Response devices and cognitive tasks [AD-A243903] p 176 N92-19365

Effects of methanol vapor on human neurobehavioral measures [PB91-243253] p 174 N92-19957

MERCURY (METAL)

Mechanisms of action of heavy metals and asbestos on cultured animal cells: Adaptation, transformation and progression [DE92-004101] p 160 N92-18887

METABOLISM

Effects of methanol vapor on human neurobehavioral measures [PB91-243253] p 174 N92-19957

METHYL ALCOHOL

Effects of methanol vapor on human neurobehavioral measures [PB91-243253] p 174 N92-19957

MICROBIOLOGY

Microbiological aspects of the environment of underwater habitats p 177 A92-26008
Technology assessment and strategy for development of a rapid field water microbiology test kit [AD-A243413] p 167 N92-18076

MICROELECTRONICS

Behavior and learning in networks with differing amounts of structure [AD-A244080] p 176 N92-19083

MICROORGANISMS

Nuclease activity of microorganisms and the problem of monitoring the state of autotrophic flora in operators in hermetically sealed environments p 164 A92-26015
Technology assessment and strategy for development of a rapid field water microbiology test kit [AD-A243413] p 167 N92-18076

Effects of liquid desiccants on airborne microorganisms: Laboratory set up, procedure development, and preliminary measurements [DE92-004749] p 160 N92-19636

MICROPROCESSORS

The Military Aircrew Head Support System (MAHSS) p 179 N92-18988

MILITARY HELICOPTERS

Design of helicopter night pilotage sensors: Lessons learned from recent flight experiments and field assessments p 183 N92-19020

MILITARY OPERATIONS

The effect of sleep deprivation and sustained military operations on near visual performance p 175 A92-26330

MIR SPACE STATION

Investigation of mental work capacity of cosmonauts aboard the Mir orbital complex p 175 A92-26005

MOLECULAR BIOLOGY

Tyrosine hydroxylase activity in *Drosophila virilis* under normal conditions and heat stress p 158 A92-27494
Phylogenetic relationships among subsurface microorganisms [DE92-004211] p 159 N92-18113

On the transition period from chemical to biological evolution [DE92-609049] p 159 N92-18132

MOLECULAR PHYSICS

The solubility of the tetragonal form of hen egg white lysozyme from pH 4.0 to 5.4 p 157 A92-25429

MONKEYS

The effect of head-down tilt and water immersion on intracranial pressure in nonhuman primates p 158 A92-26332

MOTION PERCEPTION

A model of the pilot's perception of the perturbed angular motion of the cockpit as part of the pilot's information model p 177 A92-26007

MOTION SICKNESS

Role of external respiration in the formation of the autonomic component of motion sickness p 162 A92-25260

Night-sleep pattern and the susceptibility to motion sickness p 163 A92-25274

Some characteristics of the motor function of digestive organs in humans with different susceptibilities to motion sickness p 164 A92-26014

Phasic skin conductance activity and motion sickness p 165 A92-26329

MOTION SICKNESS DRUGS

Prophylactic and sensitizing effects of biologically active substances in the simulation of vestibulovegetative disorders p 156 A92-25275

MUSCLES

The effect of weightlessness on the progress of muscle repair in rats flown on the Cosmos-2044 biosatellite p 155 A92-25261

The effect of a pulsed electromagnetic field on the accumulation of calcium ions by the sarcoplasmic reticulum of rat heart muscle p 156 A92-25270

MUSCULAR FATIGUE

The characteristics of physiological reactions of an organism during the generation of muscular effort needed to operate control pedals p 166 A92-27630

MUSCULAR FUNCTION

The influence of high, sustained acceleration stress on electromyographic activity of the trunk and leg muscles p 170 N92-18980

MUSCULAR STRENGTH

The characteristics of physiological reactions of an organism during the generation of muscular effort needed to operate control pedals p 166 A92-27630

MUSCULOSKELETAL SYSTEM

Intermittent acceleration as a countermeasure to soleus muscle atrophy p 158 A92-26548

MUTAGENS

Evaluating the human health effects of hazardous wastes: Reproduction and development, neurotoxicity, genetic toxicity, and cancer [PB92-110352] p 173 N92-19702

MYOCARDIUM

Finite element modeling of sustained +Gz acceleration induced stresses in the human ventricle myocardium p 172 N92-18992

N

NEURAL NETS

Activity-driven CNS changes in learning and development
[AD-A243790] p 175 N92-19064

Behavior and learning in networks with differing amounts of structure
[AD-A244080] p 176 N92-19083

NEURONS

Activity-driven CNS changes in learning and development
[AD-A243790] p 175 N92-19064

Regulation of brain muscarinic receptors by protein kinase C
[AD-A244419] p 172 N92-19087

Receptor subtype alterations: Bases of neuronal plasticity and learning
[AD-A244406] p 176 N92-19799

NEUROPHYSIOLOGY

Regulation of brain muscarinic receptors by protein kinase C
[AD-A244419] p 172 N92-19087

Receptor subtype alterations: Bases of neuronal plasticity and learning
[AD-A244406] p 176 N92-19799

NEUROTRANSMITTERS

Receptor subtype alterations: Bases of neuronal plasticity and learning
[AD-A244406] p 176 N92-19799

NEUTRAL BUOYANCY SIMULATION

A method of evaluating efficiency during space-suited work in a neutral buoyancy environment
[NASA-TP-3153] p 184 N92-19772

NEUTRON ACTIVATION ANALYSIS

A method for determining levels of calcium in the hand using activated neutrons from (Pu-238)-Be sources
p 177 A92-25273

NEUTRON IRRADIATION

Beneficial uses of radiation
[DE92-003024] p 168 N92-18799

NIGHT

Night-sleep pattern and the susceptibility to motion sickness
p 163 A92-25274

Analysis of the stages of the night sleep of human subjects from the standpoint of the functional quantization of the vital activity
p 166 A92-27504

The effect of field-of-view size on performance of a simulated air-to-ground night attack
p 182 N92-19018

NIGHT FLIGHTS (AIRCRAFT)

Design of helicopter night pilotage sensors: Lessons learned from recent flight experiments and field assessments
p 183 N92-19020

NIGHT VISION

Helmet Mounted Displays and Night Vision Goggles
[AGARD-CP-517] p 181 N92-19008

Fixed wing night attack EO integration and sensor fusion
p 181 N92-19009

An evaluation of the protective integrated hood mask for ANVIS night vision goggle compatibility
p 181 N92-19012

Design of helicopter night pilotage sensors: Lessons learned from recent flight experiments and field assessments
p 183 N92-19020

Comparison of second and third generation night vision goggles in time-limited scenarios
[AD-A244330] p 184 N92-19447

NUCLEAR MEDICINE

Radiopharmaceuticals for diagnosis and treatment
[DE92-004065] p 167 N92-18102

Beneficial uses of radiation
[DE92-003024] p 168 N92-18799

NUCLEAR POWER PLANTS

Phylogenetic relationships among subsurface microorganisms
[DE92-004421] p 159 N92-18113

NUCLEAR RESEARCH

Beneficial uses of radiation
[DE92-003024] p 168 N92-18799

NUCLEAR WARFARE

High altitude high acceleration and NBC warfare protective system for advanced fighter aircraft: Design considerations
p 181 N92-19000

NUCLEATION

Bubble nucleation threshold in decompartmented plasma
p 160 N92-18974

NUCLEIC ACIDS

Some indices of protein and nucleic acid metabolism in the lymphoid organs of rats subjected to hypokinesia and to vitamin-B1 deficiency
p 155 A92-25265

Nuclease activity of microorganisms and the problem of monitoring the state of automicoflora in operators in hermetically sealed environments
p 164 A92-26015

NUCLEOTIDES

The information content of some hormonal indices and cyclic nucleotides in the estimation and prediction of resistance to the effect of acute hypoxia in operators
p 163 A92-25266

O

OPERATOR PERFORMANCE

The information content of some hormonal indices and cyclic nucleotides in the estimation and prediction of resistance to the effect of acute hypoxia in operators
p 163 A92-25266

OPTICAL PROPERTIES

Pulse oximetry: Theoretical and experimental models
[OUEL-1885/91] p 168 N92-18339

ORTHOSTATIC TOLERANCE

Responses of the regional vessel tonus to the effects of orthostatic and gravitational loads
p 161 A92-25254

OXIMETRY

Pulse oximetry: Theoretical and experimental models
[OUEL-1885/91] p 168 N92-18339

OXYGEN

Physiological requirements for partial pressure assemblies for altitude protection
p 179 N92-18993

OXYGEN BREATHING

Prebreathing as a means to decrease the incidence of decompression sickness at altitude
p 169 N92-18976

OXYGEN CONSUMPTION

Influences of chemical sympathectomy, demedullation, and hindlimb suspension on the V(O₂)max of rats
p 158 A92-26334

The effects of exercise on pharmacokinetics and pharmacodynamics of physostigmine in rats
[AD-A241867] p 159 N92-18257

OXYGEN MASKS

The design and evaluation of fast-jet helmet mounted displays
p 181 N92-19010

Application of finite element modeling and analysis to the design of positive pressure oxygen masks
[AD-A244045] p 184 N92-19179

OXYGEN METABOLISM

Metabolic changes during hyperbaric oxygenation
p 164 A92-26011

OXYGEN SUPPLY EQUIPMENT

Physiological protection equipment for combat aircraft: Integration of functions, principal technologies
p 180 N92-18996

OZONE

Noninvasive determination of respiratory ozone absorption: Development of a fast-responding ozone analyzer
[PB91-243220] p 173 N92-19952

P

PARALLEL PROCESSING (COMPUTERS)

Behavior and learning in networks with differing amounts of structure
[AD-A244080] p 176 N92-19083

PARSING ALGORITHMS

Automated protocol analysis: Tools and methodology
[AD-A242040] p 175 N92-18245

PARTIAL PRESSURE

Physiological requirements for partial pressure assemblies for altitude protection
p 179 N92-18993

The experimental assessment of new partial pressure assemblies
p 180 N92-18995

The design and development of a full-cover partial pressure assembly for protection against high altitude and G
p 180 N92-18998

PATHOLOGICAL EFFECTS

Pathophysiology of spontaneous venous gas embolism
[NASA-CR-189915] p 173 N92-19761

PATTERN RECOGNITION

Attention, imagery and memory: A neuromagnetic investigation
[AD-A243859] p 175 N92-19069

Behavior and learning in networks with differing amounts of structure
[AD-A244080] p 176 N92-19083

PERFORMANCE PREDICTION

Computer simulation model of cockpit crew coordination: A crew-level error model for the US Army's Blackhawk helicopter
[AD-A243618] p 178 N92-18009

PERFORMANCE TESTS

Helmet mounted displays: Human factors and fidelity
p 183 N92-19021

Effect of increased axial field of view on the performance of a volume PET scanner
[DE92-004424] p 173 N92-19877

PHYSIOLOGICAL RESPONSES

Human performance assessment methods

[AGARD-AG-308] p 176 N92-20037

PERSONALITY

The construction of personality questionnaires for selection of aviation personnel
[DLR-FB-91-18] p 176 N92-19410

PERSONNEL SELECTION

Physiological-hygienic aspects of increasing the heat resistance in humans (Review of the literature)
p 161 A92-25251

The construction of personality questionnaires for selection of aviation personnel
[DLR-FB-91-18] p 176 N92-19410

PERSPIRATION

Phasic skin conductance activity and motion sickness
p 165 A92-26329

PHARMACOLOGY

Functional changes in the cardiovascular system and their pharmacological correction during immersion in a diving suit
p 164 A92-26013

The effects of exercise on pharmacokinetics and pharmacodynamics of physostigmine in rats
[AD-A241867] p 159 N92-18257

Regulation of brain muscarinic receptors by protein kinase C
[AD-A244419] p 172 N92-19087

PHASE TRANSFORMATIONS

On the transition period from chemical to biological evolution
[DE92-609049] p 159 N92-18132

PHYSICAL EXERCISE

Estimating the organism's nonspecific resistance from individual reaction to hypoxic testing
p 166 A92-27498

The effects of exercise on pharmacokinetics and pharmacodynamics of physostigmine in rats
[AD-A241867] p 159 N92-18257

Thermal responses during extended water immersion: Comparisons of rest and exercise, and levels of immersion
[AD-A244305] p 172 N92-19031

A method of evaluating efficiency during space-suited work in a neutral buoyancy environment
[NASA-TP-3153] p 184 N92-19772

PHYSICAL WORK

Studies of the biological activity of a nidus vespaee extract in animals subjected to physical loads
p 157 A92-26023

Dynamics of competing interaction between verbal and manual activities during adaptation and readaptation after transdimensional flight
p 166 A92-27500

PHYSIOCHEMISTRY

Functional properties of blood proteins in highly trained athletes
p 162 A92-25258

Influences of chemical sympathectomy, demedullation, and hindlimb suspension on the V(O₂)max of rats
p 158 A92-26334

PHYSIOLOGICAL EFFECTS

Night-sleep pattern and the susceptibility to motion sickness
p 163 A92-25274

Biorhythmicity in decompression sickness
p 163 A92-25957

A mathematical approach to the assessment of the accuracy of physiological parameter measurements performed by different methods
p 157 A92-26020

The effect of sleep deprivation and sustained military operations on near visual performance
p 175 A92-26330

The 1990 Hypobaric Decompression Sickness Workshop: Summary and Conclusions
p 169 N92-18975

Pulmonary effects of high-G and positive pressure breathing
p 169 N92-18978

Effects of liquid desiccants on airborne microorganisms: Laboratory set up, procedure development, and preliminary measurements
[DE92-004749] p 160 N92-19636

PHYSIOLOGICAL RESPONSES

Tolerance to chest-to-back (+Gx) and head-to-foot (+Gz) overloads during drug-induced hypohydration
p 161 A92-25253

Some characteristics of humoral immunity and nonspecific resistance in pilots
p 161 A92-25255

Glycemia as a risk factor of reduced tolerance to hypoxic hypoxia in flight personnel
p 162 A92-25256

Changes in the erythrocyte membranes and of Na(+), K(+)-ATPase in participants of the Canadian-Soviet trans-Arctic ski trek
p 162 A92-25257

Role of external respiration in the formation of the autonomic component of motion sickness
p 162 A92-25260

Variations in the prostaglandin content and in some parameters of lipid metabolism in humans under conditions of prolonged hypokinesia
p 162 A92-25263

- Emergency deposition of calcium by plasma and nonplasma buffer systems - The effect of long-term hypokinesia p 162 A92-25264
- The information content of some hormonal indices and cyclic nucleotides in the estimation and prediction of resistance to the effect of acute hypoxia in operators p 163 A92-25266
- Functional state of the CNS at an early period of the development of radiation sickness after irradiation with helium ions p 155 A92-25267
- The effect of a pulsed electromagnetic field on the accumulation of calcium ions by the sarcoplasmic reticulum of rat heart muscle p 156 A92-25270
- Investigation of the cyclic kinetics of immunity by mathematical modeling methods p 156 A92-25271
- Prophylactic and sensitizing effects of biologically active substances in the simulation of vestibulovegetative disorders p 156 A92-25275
- Protection from effects of radiation at sublethal doses during exposures to hypergravitation p 156 A92-25276
- The characteristics of prolactin secretion in response to different degrees of vestibular-analyzer lesions p 165 A92-26017
- The role of specific and nonspecific afferent systems in the mechanism of changes in cortical evoked responses to vibration p 158 A92-26025
- Phasic skin conductance activity and motion sickness p 165 A92-26329
- The effect of head-down tilt and water immersion on intracranial pressure in nonhuman primates p 158 A92-26332
- Temperature and humidity within the clothing microenvironment p 177 A92-26333
- Analysis of the stages of the night sleep of human subjects from the standpoint of the functional quantization of the vital activity p 166 A92-27504
- The characteristics of physiological reactions of an organism during the generation of muscular effort needed to operate control pedals p 166 A92-27630
- The effects of exercise on pharmacokinetics and pharmacodynamics of physostigmine in rats [AD-A241867] p 159 A92-18257
- Decompression sickness and ebullism at high altitudes p 169 A92-18973
- Bubble nucleation threshold in decomplemented plasma p 160 A92-18974
- PHYSIOLOGY**
- Physiological requirements for partial pressure assemblies for altitude protection p 179 A92-18993
- Model of air flow in a multi-bladder physiological protection system p 180 A92-18997
- High altitude high acceleration and NBC warfare protective system for advanced fighter aircraft: Design considerations p 181 A92-19000
- PILOT ERROR**
- Computer simulation model of cockpit crew coordination: A crew-level error model for the US Army's Blackhawk helicopter [AD-A243618] p 178 A92-18009
- PILOT PERFORMANCE**
- Functional state of the cardiovascular system in fighter pilots with mitral valve prolapse p 161 A92-25252
- A model of the pilot's perception of the perturbed angular motion of the cockpit as part of the pilot's information model p 177 A92-26007
- G-endurance during heat stress and balanced pressure breathing p 165 A92-26331
- Decompression sickness - An increasing risk for the private pilot p 165 A92-26335
- The characteristics of physiological reactions of an organism during the generation of muscular effort needed to operate control pedals p 166 A92-27630
- G-induced loss of consciousness accidents: USAF experience 1982-1990 p 169 A92-18977
- Subjective reports concerning assisted positive pressure breathing under high sustained acceleration p 170 A92-18983
- Assessment of physiological requirements for protection of the human cardiovascular system against high sustained gravitational stresses p 171 A92-18990
- The effect of field-of-view size on performance of a simulated air-to-ground night attack p 182 A92-19018
- Helmet mounted displays: Human factors and fidelity p 183 A92-19021
- PILOTS (PERSONNEL)**
- The construction of personality questionnaires for selection of aviation personnel [DLR-FB-91-18] p 176 A92-19410
- PLANKTON**
- Novel major archaeobacterial group from marine plankton p 159 A92-28236
- PLANTS (BOTANY)**
- Pileate mushrooms and algae - Objects for space biology --- Russian book p 156 A92-25402
- Global models for the biomechanics of green plants, part 2 [DE92-603590] p 160 A92-18757
- Global models for the biomechanics of green plants, part 3 [DE92-603591] p 160 A92-18758
- Two different approaches for control and measurement of plant functions in closed environmental chambers [PB92-108067] p 161 A92-19911
- POINTING CONTROL SYSTEMS**
- Measurement of sight direction in a centrifuge. Part 1: Head movement [REPT-1168/CEV/SE/LAMAS] p 173 A92-19347
- POLLUTION CONTROL**
- Effects of liquid desiccants on airborne microorganisms: Laboratory set up, procedure development, and preliminary measurements [DE92-004749] p 160 A92-19636
- POLYNUCLEOTIDES**
- Phylogenetic relationships among subsurface microorganisms [DE92-004421] p 159 A92-18113
- POTABLE WATER**
- Technology assessment and strategy for development of a rapid field water microbiology test kit [AD-A243413] p 167 A92-18076
- PREDICTION ANALYSIS TECHNIQUES**
- Prebreathing as a means to decrease the incidence of decompression sickness at altitude p 169 A92-18976
- PRESSURE BREATHING**
- G-endurance during heat stress and balanced pressure breathing p 165 A92-26331
- Pulmonary effects of high-G and positive pressure breathing p 169 A92-18978
- Maximum intra-thoracic pressure with PBG and AGSM [DCIEM-91-43] p 169 A92-18979
- Hemodynamic responses to pressure breathing during +Gz (PBG) in swine p 160 A92-18982
- Subjective reports concerning assisted positive pressure breathing under high sustained acceleration p 170 A92-18983
- Assisted positive pressure breathing: Effects on +Gz human tolerance in centrifuge p 170 A92-18985
- The optimisation of a positive pressure breathing system for enhanced G protection p 171 A92-18986
- A cardiovascular model of G-stress effects: Preliminary studies with positive pressure breathing p 171 A92-18989
- The experimental assessment of new partial pressure assemblies p 180 A92-18995
- Application of finite element modeling and analysis to the design of positive pressure oxygen masks [AD-A244045] p 184 A92-19179
- PRESSURE EFFECTS**
- An experimental study of the effect of high pressure on the adsorption properties of silochrome C-120 --- absorbent for air purification in hyperbaric environments p 177 A92-25269
- Decompression sickness and ebullism at high altitudes p 169 A92-18973
- Assisted positive pressure breathing: Effects on +Gz human tolerance in centrifuge p 170 A92-18985
- PRESSURE REDUCTION**
- The development of decompression regimens for excursion dives using data from prolonged exposures to 21 ata p 164 A92-26010
- French equipment for integrated protection of combat aircraft crews: Principles and tests at high altitudes p 180 A92-18994
- The experimental assessment of new partial pressure assemblies p 180 A92-18995
- PRESSURE SENSORS**
- Maximum intra-thoracic pressure with PBG and AGSM [DCIEM-91-43] p 169 A92-18979
- PRESSURE SUITS**
- Subjective reports concerning assisted positive pressure breathing under high sustained acceleration p 170 A92-18983
- Effects on Gz endurance/tolerance of reduced pressure schedules using the Advanced Technology Anti-G Suite (ATAGS) p 171 A92-18987
- A cardiovascular model of G-stress effects: Preliminary studies with positive pressure breathing p 171 A92-18989
- Physiological requirements for partial pressure assemblies for altitude protection p 179 A92-18993
- French equipment for integrated protection of combat aircraft crews: Principles and tests at high altitudes p 180 A92-18994
- The experimental assessment of new partial pressure assemblies p 180 A92-18995
- Physiological protection equipment for combat aircraft: Integration of functions, principal technologies p 180 A92-18996
- Model of air flow in a multi-bladder physiological protection system p 180 A92-18997
- The design and development of a full-cover partial pressure assembly for protection against high altitude and G p 180 A92-18998
- Advances in the design of military aircrew breathing systems with respect to high altitude and high acceleration conditions p 180 A92-18999
- PRESSURE VESSELS**
- Model of air flow in a multi-bladder physiological protection system p 180 A92-18997
- PROBLEM SOLVING**
- Individual difference effects in human-computer interaction [AD-A243172] p 179 A92-18516
- PROSTAGLANDINS**
- Variations in the prostaglandin content and in some parameters of lipid metabolism in humans under conditions of prolonged hypokinesia p 162 A92-25263
- PROTECTION**
- Physiological requirements for partial pressure assemblies for altitude protection p 179 A92-18993
- Model of air flow in a multi-bladder physiological protection system p 180 A92-18997
- The design and development of a full-cover partial pressure assembly for protection against high altitude and G p 180 A92-18998
- High altitude high acceleration and NBC warfare protective system for advanced fighter aircraft: Design considerations p 181 A92-19000
- PROTECTIVE CLOTHING**
- Functional changes in the cardiovascular system and their pharmacological correction during immersion in a diving suit p 164 A92-26013
- Temperature and humidity within the clothing microenvironment p 177 A92-26333
- PROTEIN CRYSTAL GROWTH**
- The solubility of the tetragonal form of hen egg white lysozyme from pH 4.0 to 5.4 p 157 A92-25429
- PROTEIN METABOLISM**
- Some indices of protein and nucleic acid metabolism in the lymphoid organs of rats subjected to hypokinesia and to vitamin-B1 deficiency p 155 A92-25265
- Metabolic changes during hyperbaric oxygenation p 164 A92-26011
- PROTEINS**
- The characteristics of prolactin secretion in response to different degrees of vestibular-analyzer lesions p 165 A92-26017
- Analysis of the protein content in blood plasma of rats after their flight aboard the biosatellite Cosmos-1887, using two-dimensional electrophoresis p 157 A92-26022
- Bubble nucleation threshold in decomplemented plasma p 160 A92-18974
- Regulation of brain muscarinic receptors by protein kinase C [AD-A244419] p 172 A92-19087
- PROTOCOL (COMPUTERS)**
- Automated protocol analysis: Tools and methodology [AD-A242040] p 175 A92-18245
- Human performance assessment methods [AGARD-AG-308] p 176 A92-20037
- PSYCHOMETRICS**
- Analysis of the stages of the night sleep of human subjects from the standpoint of the functional quantization of the vital activity p 166 A92-27504
- The construction of personality questionnaires for selection of aviation personnel [DLR-FB-91-18] p 176 A92-19410
- Human performance assessment methods [AGARD-AG-308] p 176 A92-20037
- PSYCHOPHYSIOLOGY**
- Night-sleep pattern and the susceptibility to motion sickness p 163 A92-25274
- Psychophysiological training of multiseat-aircraft flight personnel for coordinating activities during emergency situations p 167 A92-27642
- PUBLIC HEALTH**
- Mechanisms of action of heavy metals and asbestos on cultured animal cells: Adaptation, transformation and progression [DE92-004101] p 160 A92-18887
- PULMONARY CIRCULATION**
- Pulmonary effects of high-G and positive pressure breathing p 169 A92-18978

R

Mechanisms for radiation damage in DNA
[DE91-019079] p 168 N92-18419

RADIATION DOSAGE
Ionizing radiation risk assessment, BEIR 4
[DE92-004014] p 172 N92-19273

RADIATION EFFECTS
Content and composition of free fatty acids in the sarcoplasmic reticulum membranes after exposure to ionizing radiation p 159 A92-28370
The molecular basis for UV response of cultured human cells
[DE92-003766] p 167 N92-18296

RADIATION INJURIES
The primary-reaction syndrome caused by a radiation exposure (Review of the literature) p 166 A92-27629

RADIATION SICKNESS
Functional state of the CNS at an early period of the development of radiation sickness after irradiation with helium ions p 155 A92-25267

RADIATION THERAPY
Beneficial uses of radiation
[DE92-003024] p 168 N92-18799

RADIATION TOLERANCE
Protection from effects of radiation at sublethal doses during exposures to hypergravitation p 156 A92-25276

RADICALS
Mechanisms for radiation damage in DNA
[DE91-019080] p 167 N92-18025

RADIOACTIVE ISOTOPES
Radiopharmaceuticals for diagnosis and treatment
[DE92-004065] p 167 N92-18102

RADIOBIOLOGY
Protection from effects of radiation at sublethal doses during exposures to hypergravitation p 156 A92-25276
The primary-reaction syndrome caused by a radiation exposure (Review of the literature) p 166 A92-27629

RADIOCHEMISTRY
Radiopharmaceuticals for diagnosis and treatment
[DE92-004065] p 167 N92-18102

RADIOLOGY
The primary-reaction syndrome caused by a radiation exposure (Review of the literature) p 166 A92-27629

RADIOPATHOLOGY
Functional state of the CNS at an early period of the development of radiation sickness after irradiation with helium ions p 155 A92-25267

RADON
Ionizing radiation risk assessment, BEIR 4
[DE92-004014] p 172 N92-19273

RATS
The effects of exercise on pharmacokinetics and pharmacodynamics of physostigmine in rats
[AD-A241867] p 159 N92-18257
Regulation of brain muscarinic receptors by protein kinase C
[AD-A244419] p 172 N92-19087

REACTION TIME
Characteristics of behavioral reactions of rats exposed to constant electric fields of different voltage p 157 A92-26024

RECEPTORS (PHYSIOLOGY)
Activity-driven CNS changes in learning and development
[AD-A243790] p 175 N92-19064
Receptor subtype alterations: Bases of neuronal plasticity and learning
[AD-A244406] p 176 N92-19799

REDUCED GRAVITY
Effects of a simulated microgravity model on cell structure and function in rat testis and epididymis p 158 A92-26549
Chemical hazards database and detection system for Microgravity and Materials Processing Facility (MMPF)
[NASA-CR-184274] p 179 N92-18927

REGULATORS
Advances in the design of military aircrew breathing systems with respect to high altitude and high acceleration conditions p 180 N92-18999
High altitude high acceleration and NBC warfare protective system for advanced fighter aircraft: Design considerations p 181 N92-19000

RESCUE OPERATIONS
Use of air transport in delivering medical help to victims in the area of an earthquake epicenter p 163 A92-25956

RESPIRATION
Effects of methanol vapor on human neurobehavioral measures
[PB91-243253] p 174 N92-19957

RESPIRATORS
High altitude high acceleration and NBC warfare protective system for advanced fighter aircraft: Design considerations p 181 N92-19000

RESPIRATORY PHYSIOLOGY
Role of external respiration in the formation of the autonomic component of motion sickness p 162 A92-25260
Pathophysiology of spontaneous venous gas embolism
[NASA-CR-189915] p 173 N92-19761

RESPIRATORY RATE
External respiration and gas exchange during space flights p 163 A92-26004
External respiration and gas exchange in humans undergoing simulated diving at 350 m p 164 A92-26009
Noninvasive determination of respiratory ozone absorption: Development of a fast-responding ozone analyzer
[PB91-243220] p 173 N92-19952

RESPIRATORY SYSTEM
Hyperventilation --- Russian book
[ISBN 5-02-005854-8] p 163 A92-25401
Maximum intra-thoracic pressure with PBG and AGSM
[DCIEM-91-43] p 169 N92-18979

RESPONSES
Response devices and cognitive tasks
[AD-A243903] p 176 N92-19365

REST
Thermal responses during extended water immersion: Comparisons of rest and exercise, and levels of immersion
[AD-A244305] p 172 N92-19031

RETENTION (PSYCHOLOGY)
Receptor subtype alterations: Bases of neuronal plasticity and learning
[AD-A244406] p 176 N92-19799

RETINAL IMAGES
Multidimensional signal coding in the visual system
[AD-A244281] p 179 N92-18816

RIBONUCLEIC ACIDS
Novel major archaeobacterial group from marine plankton p 159 A92-28236
Phylogenetic relationships among subsurface microorganisms
[DE92-004421] p 159 N92-18113

RISK
Ionizing radiation risk assessment, BEIR 4
[DE92-004014] p 172 N92-19273

ROBOT ARMS
Arm of the future --- for space station robotics p 178 A92-27373

ROBOT CONTROL
Supervisory telerobotics testbed for unstructured environments p 178 A92-26660

ROBOTICS
Near-minimum-time control of a flexible manipulator p 178 A92-28150

S

SAFETY FACTORS
Chemical hazards database and detection system for Microgravity and Materials Processing Facility (MMPF)
[NASA-CR-184274] p 179 N92-18927

SAFETY MANAGEMENT
Organizational aspects for preventing human faults in space systems: Systems engineering approaches to total quality management
[MBB-UK-0139-91-PUB] p 179 N92-18481

SALMONELLA
Nuclease activity of microorganisms and the problem of monitoring the state of autotrophic flora in operators in hermetically sealed environments p 164 A92-26015

SARCOPLASMIC RETICULUM
The effect of a pulsed electromagnetic field on the accumulation of calcium ions by the sarcoplasmic reticulum of rat heart muscle p 156 A92-25270
Content and composition of free fatty acids in the sarcoplasmic reticulum membranes after exposure to ionizing radiation p 159 A92-28370

SCHEDULES
French equipment for integrated protection of combat aircraft crews: Principles and tests at high altitudes p 180 N92-18994

SCINTILLATION COUNTERS
Effect of increased axial field of view on the performance of a volume PET scanner
[DE92-004424] p 173 N92-19877

SEARCHING
PILOTS: User's guide
[PB92-100262] p 173 N92-19689

SECRECTIONS
The characteristics of prolactin secretion in response to different degrees of vestibular-analyzer lesions p 165 A92-26017

SENSORIMOTOR PERFORMANCE
Restriction of the field of vision: Influence on eye-head coordination during orientation towards an eccentric target p 182 N92-19017

SERUMS
Bubble nucleation threshold in deoxygenated plasma p 160 N92-18974

SERVOCONTROL
Supervisory telerobotics testbed for unstructured environments p 178 A92-26660

SIGNAL DETECTION
Binaural masking: An analysis of models
[AD-A244392] p 168 N92-18859

SIGNAL ENCODING
Multidimensional signal coding in the visual system
[AD-A244281] p 179 N92-18816

SIGNAL PROCESSING
Multidimensional signal coding in the visual system
[AD-A244281] p 179 N92-18816
Binaural masking: An analysis of models
[AD-A244392] p 168 N92-18859

SIGNAL TO NOISE RATIOS
Comparison of second and third generation night vision goggles in time-limited scenarios
[AD-A244330] p 184 N92-19447

SIGNS AND SYMPTOMS
The primary-reaction syndrome caused by a radiation exposure (Review of the literature) p 166 A92-27629

SIMULATORS
Biomechanical response of the head to G+ accelerations: Benefit for studies in combat simulators p 182 N92-19014

SKIN TEMPERATURE (BIOLOGY)
Temperature and humidity within the clothing microenvironment p 177 A92-26333

SLEEP
Night-sleep pattern and the susceptibility to motion sickness p 163 A92-25274
Analysis of the stages of the night sleep of human subjects from the standpoint of the functional quantization of the vital activity p 166 A92-27504
Crew factors in flight operations. 8: Factors influencing sleep timing and subjective sleep quality in commercial long-haul flight crews
[NASA-TM-103852] p 174 N92-19977

SLEEP DEPRIVATION
The effect of sleep deprivation and sustained military operations on near visual performance p 175 A92-26330
Crew factors in flight operations. 8: Factors influencing sleep timing and subjective sleep quality in commercial long-haul flight crews
[NASA-TM-103852] p 174 N92-19977

SOLUBILITY
The solubility of the tetragonal form of hen egg white lysozyme from pH 4.0 to 5.4 p 157 A92-25429

SPACE FLIGHT
Analysis of the protein content in blood plasma of rats after their flight aboard the biosatellite Cosmos-1887, using two-dimensional electrophoresis p 157 A92-26022

SPACE HABITATS
Pileate mushrooms and algae - Objects for space biology --- Russian book p 156 A92-25402

SPACE PERCEPTION
The effects upon visual performance of varying binocular overlap p 182 N92-19016

SPACE STATION FREEDOM
Arm of the future --- for space station robotics p 178 A92-27373
Chemical hazards database and detection system for Microgravity and Materials Processing Facility (MMPF)
[NASA-CR-184274] p 179 N92-18927

SPACE STATIONS
Intermittent acceleration as a countermeasure to soleus muscle atrophy p 158 A92-26548

SPACE SUITS
A method of evaluating efficiency during space-suited work in a neutral buoyancy environment
[NASA-TP-3153] p 184 N92-19772

SPACE TOOLS
Arm of the future --- for space station robotics p 178 A92-27373

SPACEBORNE EXPERIMENTS
Pileate mushrooms and algae - Objects for space biology --- Russian book p 156 A92-25402
Basic approaches to spacecraft studies of the biological effect of heavy ions of galactic cosmic rays p 157 A92-26021
Ultrastructural organization of chlorella cells cultivated on a solid medium in microgravity p 159 A92-28384

SPACECRAFT CABIN ATMOSPHERES
External respiration and gas exchange during space flights p 163 A92-26004

SPACECRAFT CONTAMINATION

A method for a comprehensive assessment of technical equipment for the medical compartment of a spacecraft
p 177 A92-26019

SPACECRAFT MAINTENANCE

Supervisory telerobotics testbed for unstructured environments
p 178 A92-26660

SPACECREWS

French equipment for integrated protection of combat aircraft crews: Principles and tests at high altitudes
p 180 N92-18994

SPECTROPHOTOMETRY

Pulse oximetry: Theoretical and experimental models [OUEL-1885/91]
p 168 N92-18339

SPLEEN

Some indices of protein and nucleic acid metabolism in the lymphoid organs of rats subjected to hypokinesia and to vitamin-B1 deficiency
p 155 A92-25265

STATISTICAL ANALYSIS

The construction of personality questionnaires for selection of aviation personnel [DLR-FB-91-18]
p 176 N92-19410

STEMS

Global models for the biomechanics of green plants, part 2
[DE92-603590]
p 160 N92-18757
Global models for the biomechanics of green plants, part 3
[DE92-603591]
p 160 N92-18758

STRAPS

The RAF Institute of Aviation Medicine proposed helmet fitting/retention system
p 181 N92-19013

STRESS (PHYSIOLOGY)

Studies of the biological activity of a nidus vespaee extract in animals subjected to physical loads
p 157 A92-26023

Decompression sickness and ebullism at high altitudes
p 169 N92-18973
Prebreathing as a means to decrease the incidence of decompression sickness at altitude
p 169 N92-18976

STROKE VOLUME

A mathematical approach to the assessment of the accuracy of physiological parameter measurements performed by different methods
p 157 A92-26020

STRUCTURAL STABILITY

Horizontal impact tests of the Advanced Dynamic Anthropomorphic Manikin (ADAM)
[AD-A243857]
p 184 N92-19829

SUPPORT SYSTEMS

The Military Aircrew Head Support System (MAHSS)
p 179 N92-18988

SUSPENDING (HANGING)

Effects of a simulated microgravity model on cell structure and function in rat testis and epididymis
p 158 A92-26549

SWINE

Hemodynamic responses to pressure breathing during +Gz (PBG) in swine
p 160 N92-18982

SYMPATHETIC NERVOUS SYSTEM

Influences of chemical sympathectomy, demedullation, and hindlimb suspension on the V(O2)max of rats
p 158 A92-26334

SYNAPSES

Activity-driven CNS changes in learning and development
[AD-A243790]
p 175 N92-19064

SYNCOPE

Pulmonary effects of high-G and positive pressure breathing
p 169 N92-18978

SYNTHESIS (CHEMISTRY)

Radiopharmaceuticals for diagnosis and treatment
[DE92-004065]
p 167 N92-18102

SYSTEMS ENGINEERING

Development of an electromyography and accelerometry ambulatory recording system
[CERB-91-07]
p 184 N92-19926

SYSTEMS INTEGRATION

Helmet Mounted Displays and Night Vision Goggles [AGARD-CP-517]
p 181 N92-19008
Fixed wing night attack EO integration and sensor fusion
p 181 N92-19009
Helicopter integrated helmet requirements and test results
p 181 N92-19011

SYSTOLIC PRESSURE

G-induced loss of consciousness accidents: USAF experience 1982-1990
p 169 N92-18977

T**TARGET ACQUISITION**

The effect of field-of-view size on performance of a simulated air-to-ground night attack
p 182 N92-19018

TASK COMPLEXITY

Response devices and cognitive tasks
[AD-A243903]
p 176 N92-19365

TASK PLANNING (ROBOTICS)

Supervisory telerobotics testbed for unstructured environments
p 178 A92-26660

TECHNOLOGY ASSESSMENT

Technology assessment and strategy for development of a rapid field water microbiology test kit
[AD-A243413]
p 167 N92-18076

TECHNOLOGY UTILIZATION

Beneficial uses of radiation
[DE92-003024]
p 168 N92-18799

TELEOPERATORS

Near-minimum-time control of a flexible manipulator
p 178 A92-28150

TELEROBOTICS

Supervisory telerobotics testbed for unstructured environments
p 178 A92-26660

TEMPERATURE EFFECTS

G-endurance during heat stress and balanced pressure breathing
p 165 A92-26331
Tyrosine hydroxylase activity in *Drosophila virilis* under normal conditions and heat stress
p 158 A92-27494

TEST CHAMBERS

Two different approaches for control and measurement of plant functions in closed environmental chambers
[PB92-108067]
p 161 N92-19911

TESTES

Effects of a simulated microgravity model on cell structure and function in rat testis and epididymis
p 158 A92-26549

THERMAL PROTECTION

Physiological protection equipment for combat aircraft: Integration of functions, principal technologies
p 180 N92-18996

THERMAL STRESSES

Investigation of the effect of cooling the feet as a means of reducing thermal stress
[AD-A244264]
p 172 N92-19333

THERMODYNAMICS

Model of air flow in a multi-bladder physiological protection system
p 180 N92-18997

THERMOREGULATION

Thermal responses during extended water immersion: Comparisons of rest and exercise, and levels of immersion
[AD-A244305]
p 172 N92-19031
Investigation of the effect of cooling the feet as a means of reducing thermal stress
[AD-A244264]
p 172 N92-19333

THIAMINE

Some indices of protein and nucleic acid metabolism in the lymphoid organs of rats subjected to hypokinesia and to vitamin-B1 deficiency
p 155 A92-25265

THORAX

Maximum intra-thoracic pressure with PBG and AGSM [DCIEM-91-43]
p 169 N92-18979

THORIUM

Ionizing radiation risk assessment, BEIR 4
[DE92-004014]
p 172 N92-19273

THYMUS GLAND

Some indices of protein and nucleic acid metabolism in the lymphoid organs of rats subjected to hypokinesia and to vitamin-B1 deficiency
p 155 A92-25265

TIME OPTIMAL CONTROL

Near-minimum-time control of a flexible manipulator
p 178 A92-28150

TISSUES (BIOLOGY)

Dynamics of kidney tissue and vessel changes in white rats due to acute cold stress
p 158 A92-27600

TOLERANCES (PHYSIOLOGY)

Effects on Gz endurance/tolerance of reduced pressure schedules using the Advanced Technology Anti-G Suite (ATAGS)
p 171 N92-18987

TORSO

The influence of high, sustained acceleration stress on electromyographic activity of the trunk and leg muscles
p 170 N92-18980
The Military Aircrew Head Support System (MAHSS)
p 179 N92-18988

TOTAL QUALITY MANAGEMENT

Organizational aspects for preventing human faults in space systems: Systems engineering approaches to total quality management
[MBB-UK-0139-91-PUB]
p 179 N92-18481

TOXIC HAZARDS

Chemical hazards database and detection system for Microgravity and Materials Processing Facility (MMPF)
[NASA-CR-184274]
p 179 N92-18927

Evaluating the human health effects of hazardous wastes: Reproduction and development, neurotoxicity, genetic toxicity, and cancer
[PB92-110352]
p 173 N92-19702

TOXICITY

Mechanisms of action of heavy metals and asbestos on cultured animal cells: Adaptation, transformation and progression
[DE92-004101]
p 160 N92-18887

Evaluating the human health effects of hazardous wastes: Reproduction and development, neurotoxicity, genetic toxicity, and cancer
[PB92-110352]
p 173 N92-19702

Effects of methanol vapor on human neurobehavioral measures
[PB91-243253]
p 174 N92-19957

Development of a lung-cell model for studying workplace genotoxins
[PB92-114644]
p 174 N92-20020

TRACHEA

Noninvasive determination of respiratory ozone absorption: Development of a fast-responding ozone analyzer
[PB91-243220]
p 173 N92-19952

TRANSMISSIVITY

An evaluation of the protective integrated hood mask for ANVIS night vision goggle compatibility
p 181 N92-19012

TRANSPORT AIRCRAFT

Use of air transport in delivering medical help to victims in the area of an earthquake epicenter
p 163 A92-25956

TYROSINE

Tyrosine hydroxylase activity in *Drosophila virilis* under normal conditions and heat stress
p 158 A92-27494

U**ULTRAVIOLET RADIATION**

The molecular basis for UV response of cultured human cells
[DE92-003766]
p 167 N92-18296

UNCONSCIOUSNESS

High Altitude and High Acceleration Protection for Military Aircrew [AGARD-CP-516]
p 168 N92-18972
G-induced loss of consciousness accidents: USAF experience 1982-1990
p 169 N92-18977
Pulmonary effects of high-G and positive pressure breathing
p 169 N92-18978
G-LOC, Gz and brain hypoxia, Gz/s and intracranial hypertension
p 170 N92-18984
Circulatory biomechanics effects of accelerations
p 171 N92-18991

UNDERWATER PHYSIOLOGY

Biorhythmicity in decompression sickness
p 163 A92-25957
Microbiological aspects of the environment of underwater habitats
p 177 A92-26008

USER MANUALS (COMPUTER PROGRAMS)

PILOTS: User's guide
[PB92-100262]
p 173 N92-19689

V**VACUUM EFFECTS**

Decompression sickness and ebullism at high altitudes
p 169 N92-18973

VALSALVA EXERCISE

The Valsalva maneuver and its limited value in predicting +Gz-tolerance
p 170 N92-18981

VALVES

High altitude high acceleration and NBC warfare protective system for advanced fighter aircraft: Design considerations
p 181 N92-19000

VAPORS

Effects of methanol vapor on human neurobehavioral measures
[PB91-243253]
p 174 N92-19957

VEGETATION GROWTH

Ultrastructural organization of *Chlorella* cells cultivated on a solid medium in microgravity
p 159 A92-28384

VERBAL COMMUNICATION

Dynamics of competing interaction between verbal and manual activities during adaptation and readaptation after transmeridional flight
p 166 A92-27500

VESTIBULAR TESTS

Prophylactic and sensitizing effects of biologically active substances in the simulation of vestibulovegetative disorders
p 156 A92-25275
The characteristics of prolactin secretion in response to different degrees of vestibular-analyzer lesions
p 165 A92-26017

VESTIBULES

The effect of various types of abnormalities of the cupulodolymphatic system of the vestibular apparatus on the system's dynamic characteristics
p 155 A92-25259

VISION

The effect of sleep deprivation and sustained military operations on near visual performance
p 175 A92-26330

Restriction of the field of vision: Influence on eye-head coordination during orientation towards an eccentric target p 182 N92-19017

Effects of methanol vapor on human neurobehavioral measures [PB91-243253] p 174 N92-19957

VISUAL ACUITY

An evaluation of the protective integrated hood mask for ANVIS night vision goggle compatibility p 181 N92-19012

VISUAL FIELDS

Multidimensional signal coding in the visual system [AD-A244281] p 179 N92-18816

Restriction of the field of vision: Influence on eye-head coordination during orientation towards an eccentric target p 182 N92-19017

Attitude maintenance using an off-boresight helmet-mounted virtual display p 183 N92-19022

VISUAL PERCEPTION

Measurement of sight direction in a centrifuge. Part 2: Eye movement [REPT-1169/CEV/SE/LAMAS] p 172 N92-19255

VISUAL TASKS

Aircrew tasks and cognitive complexity [ARL-SYS-TM-150] p 178 N92-18051

W

WARFARE

High altitude high acceleration and NBC warfare protective system for advanced fighter aircraft: Design considerations p 181 N92-19000

WASTE DISPOSAL

Evaluating the human health effects of hazardous wastes: Reproduction and development, neurotoxicity, genetic toxicity, and cancer [PB92-110352] p 173 N92-19702

WATER IMMERSION

Functional changes in the cardiovascular system and their pharmacological correction during immersion in a diving suit p 164 A92-26013

The effect of head-down tilt and water immersion on intracranial pressure in nonhuman primates p 158 A92-26332

Thermal responses during extended water immersion: Comparisons of rest and exercise, and levels of immersion [AD-A244305] p 172 N92-19031

WATER QUALITY

Technology assessment and strategy for development of a rapid field water microbiology test kit [AD-A243413] p 167 N92-18076

WATER TREATMENT

Biocatalysis using immobilized cells or enzymes as a method of water and air purification in a hermetically sealed habitat p 177 A92-26016

WEAPONS DELIVERY

The effect of field-of-view size on performance of a simulated air-to-ground night attack p 182 N92-19018

WEIGHTLESSNESS

The effect of weightlessness on the progress of muscle repair in rats flown on the Cosmos-2044 biosatellite p 155 A92-25261

The effect of weightlessness on healing of bone fractures in rats flown on the Cosmos-2044 biosatellite p 155 A92-25262

WEIGHTLESSNESS SIMULATION

Functional changes in the cardiovascular system and their pharmacological correction during immersion in a diving suit p 164 A92-26013

The effect of head-down tilt and water immersion on intracranial pressure in nonhuman primates p 158 A92-26332

WORK CAPACITY

Physiological-hygienic aspects of increasing the heat resistance in humans (Review of the literature) p 161 A92-25251

Investigation of mental work capacity of cosmonauts aboard the Mir orbital complex p 175 A92-26005

Studies of the biological activity of a nidus vespaee extract in animals subjected to physical loads p 157 A92-26023

A method of evaluating efficiency during space-suited work in a neutral buoyancy environment [NASA-TP-3153] p 184 N92-19772

WORK-REST CYCLE

Thermal responses during extended water immersion: Comparisons of rest and exercise, and levels of immersion [AD-A244305] p 172 N92-19031

Crew factors in flight operations. 8: Factors influencing sleep timing and subjective sleep quality in commercial long-haul flight crews [NASA-TM-103852] p 174 N92-19977

WORKLOADS (PSYCHOPHYSIOLOGY)

Computer simulation model of cockpit crew coordination: A crew-level error model for the US Army's Blackhawk helicopter [AD-A243618] p 178 N92-18009

Aircrew tasks and cognitive complexity [ARL-SYS-TM-150] p 178 N92-18051

WORKSTATIONS

Aircrew tasks and cognitive complexity [ARL-SYS-TM-150] p 178 N92-18051

WOUND HEALING

The effect of weightlessness on the progress of muscle repair in rats flown on the Cosmos-2044 biosatellite p 155 A92-25261

The effect of weightlessness on healing of bone fractures in rats flown on the Cosmos-2044 biosatellite p 155 A92-25262

X

X RAY IRRADIATION

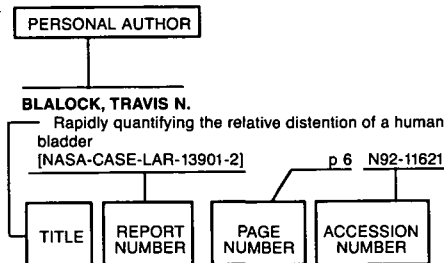
Content and composition of free fatty acids in the sarcoplasmic reticulum membranes after exposure to ionizing radiation p 159 A92-28370

PERSONAL AUTHOR INDEX

AEROSPACE MEDICINE AND BIOLOGY / A Continuing Bibliography (Supplement 363)

June 1992

Typical Personal Author Index Listing



Listings in this index are arranged alphabetically by personal author. The title of the document provides the user with a brief description of the subject matter. The report number helps to indicate the type of document listed (e.g., NASA report, translation, NASA contractor report). The page and accession numbers are located beneath and to the right of the title. Under any one author's name the accession numbers are arranged in sequence.

A

- ADAMIAN, TS. I.**
The role of specific and nonspecific afferent systems in the mechanism of changes in cortical evoked responses to vibration p 158 A92-26025
- ADAMOVICH, B. A.**
A method for a comprehensive assessment of technical equipment for the medical compartment of a spacecraft p 177 A92-26019
- ADAMS, K. F.**
Effects of 4 percent and 6 percent carboxyhemoglobin on arrhythmia production in patients with coronary artery disease [PB91-243246] p 174 N92-19956
- AFONIN, B. V.**
Some characteristics of the motor function of digestive organs in humans with different susceptibilities to motion sickness p 164 A92-26014
- ALAIN, A.**
Biomechanical response of the head to G+ accelerations: Benefit for studies in combat simulators p 182 N92-19014
- ALBERTINE, K. H.**
Pathophysiology of spontaneous venous gas embolism [NASA-CR-189915] p 173 N92-19761
- AMBAROAR, ANITA K.**
Individual difference effects in human-computer interaction [AD-A243172] p 179 N92-18516
- ANTROPOV, A. N.**
Biorhythmicity in decompression sickness p 163 A92-25957
- APLIN, JUDY E.**
The design and development of a full-cover partial pressure assembly for protection against high altitude and G p 180 N92-18998
- ARUSTAMOV, O. V.**
The effect of weightlessness on healing of bone fractures in rats flown on the Cosmos-2044 biosatellite p 155 A92-25262
- ASIAMOLOVA, N. M.**
External respiration and gas exchange during space flights p 163 A92-26004

- AZAROVA, M. V.**
An experimental study of the effect of high pressure on the adsorption properties of silochrome C-120 p 177 A92-25269
- AZARSKOV, V. N.**
A model of the pilot's perception of the perturbed angular motion of the cockpit as part of the pilot's information model p 177 A92-26007

B

- BADAKVA, A. M.**
The effects of isolated and combined exposures to a constant magnetic field and antiorthostatic hypokinesia on the central hemodynamics in rats p 156 A92-25268
- BAKLAVADZHIAN, O. G.**
The role of specific and nonspecific afferent systems in the mechanism of changes in cortical evoked responses to vibration p 158 A92-26025
- BALARAM, J.**
Supervisory telerobotics testbed for unstructured environments p 178 A92-26660
- BALL, RICHARD**
Effects of a simulated microgravity model on cell structure and function in rat testis and epididymis p 158 A92-26549
- BALLDIN, U. I.**
G-endurance during heat stress and balanced pressure breathing p 165 A92-26331
- BARANOV, V. M.**
Role of external respiration in the formation of the autonomic component of motion sickness p 162 A92-25260
- BARANOVA, E. V.**
External respiration and gas exchange during space flights p 163 A92-26004
- BARANOVA, E. V.**
Responses of the regional vessel tonus to the effects of orthostatic and gravitational loads p 161 A92-25254
- BARKER, A.**
Development of a revised mathematical model of the gastrointestinal tract [DE92-004748] p 168 N92-18598
- BARSON, JOHN V.**
The RAF Institute of Aviation Medicine proposed helmet fitting/retention system p 181 N92-19013
- BEAUSSANT, RAYMOND**
Physiological protection equipment for combat aircraft: Integration of functions, principal technologies p 180 N92-18996
- BELIKOV, V. V.**
The characteristics of physiological reactions of an organism during the generation of muscular effort needed to operate control pedals p 166 A92-27630
- BELOSHITSKII, P. V.**
The effect of the metabolic preparation Rikavit on the process of human adaptation to high altitudes p 166 A92-27499
- BEN-JEBRIA, A.**
Noninvasive determination of respiratory ozone absorption: Development of a fast-responding ozone analyzer [PB91-243220] p 173 N92-19952
- BENDER, EDWARD J.**
Comparison of second and third generation night vision goggles in time-limited scenarios [AD-A244330] p 184 N92-19447
- BERGMAN, F. J.**
Effects of methanol vapor on human neurobehavioral measures [PB91-243253] p 174 N92-19957
- BERNINGER, DANIEL**
Human factors in aviation maintenance, phase 1 [AD-A243844] p 184 N92-19808
- BESTMAN, A. R.**
Global models for the biomechanics of green plants, part 2 [DE92-603590] p 160 N92-18757
- BESTMAN, A. R.**
Global models for the biomechanics of green plants, part 3 [DE92-603591] p 160 N92-18758

- BITTERMAN, BRUCE H.**
Application of finite element modeling and analysis to the design of positive pressure oxygen masks [AD-A244045] p 184 N92-19179
- BLACK, WILLIAM R.**
Decompression sickness - An increasing risk for the private pilot p 165 A92-26335
- BLOKHIN, L. N.**
A model of the pilot's perception of the perturbed angular motion of the cockpit as part of the pilot's information model p 177 A92-26007
- BOBROVNIKII, I. P.**
The information content of some hormonal indices and cyclic nucleotides in the estimation and prediction of resistance to the effect of acute hypoxia in operators p 163 A92-25266
- BOCHENKOV, A. A.**
Some characteristics of humoral immunity and nonspecific resistance in pilots p 161 A92-25255
- BOGATSKA, L. N.**
Content and composition of free fatty acids in the sarcoplasmic reticulum membranes after exposure to ionizing radiation p 159 A92-28370
- BOIKO, N. V.**
The characteristics of prolactin secretion in response to different degrees of vestibular-analyzer lesions p 165 A92-26017
- BOOTH, FRANK W.**
Intermittent acceleration as a countermeasure to soleus muscle atrophy p 158 A92-26548
- BOROVNIKOV, V. P.**
An experimental study of the effect of high pressure on the adsorption properties of silochrome C-120 p 177 A92-25269
- BOURSE, C.**
Biomechanical response of the head to G+ accelerations: Benefit for studies in combat simulators p 182 N92-19014
- BRADFORD, CHARLES E.**
Comparison of second and third generation night vision goggles in time-limited scenarios [AD-A244330] p 184 N92-19447
- BRAGINA, M. P.**
Microbiological aspects of the environment of underwater habitats p 177 A92-26008
- BRIANE, M.**
G-LOC. Gz and brain hypoxia. Gz/s and intracranial hypertension p 170 N92-18984
- BRUSCHERA, D.**
Development of an electromyography and accelerometry ambulatory recording system [CERB-91-07] p 184 N92-19926
- BUCHSBAUM, GERSHON**
Multidimensional signal coding in the visual system [AD-A244281] p 179 N92-18816
- BUCKENMEYER, P.**
The effects of exercise on pharmacokinetics and pharmacodynamics of physostigmine in rats [AD-A241867] p 159 N92-18257
- BUGROV, S. A.**
Use of air transport in delivering medical help to victims in the area of an earthquake epicenter p 163 A92-25956
- BUHRMAN, JOHN R.**
Horizontal impact tests of the Advanced Dynamic Anthropomorphic Manikin (ADAM) [AD-A243857] p 184 N92-19829
- BUI, TRANG**
Design of helicopter night pilotage sensors: Lessons learned from recent flight experiments and field assessments p 183 N92-19020
- BUICK, F.**
Maximum intra-thoracic pressure with PBG and AGSM [DCIEM-91-43] p 169 N92-18979
- BURDIN, V. V.**
A model of the pilot's perception of the perturbed angular motion of the cockpit as part of the pilot's information model p 177 A92-26007
- BURKOVSKAIA, T. E.**
The effect of weightlessness on the progress of muscle repair in rats flown on the Cosmos-2044 biosatellite p 155 A92-25261

The effect of weightlessness on healing of bone fractures in rats flown on the Cosmos-2044 biosatellite
p 155 A92-25262

BURNS, J. W.

Hemodynamic responses to pressure breathing during +Gz (PBG) in swine p 160 N92-18982
Assisted positive pressure breathing: Effects on +Gz human tolerance in centrifuge p 170 N92-18985

BUSHOV, I. V.

Estimating the organism's nonspecific resistance from individual reaction to hypoxic testing
p 166 A92-27498

C**CACIOPPO, ELIZABETH**

The solubility of the tetragonal form of hen egg white lysozyme from pH 4.0 to 5.4 p 157 A92-25429

CALHOUN, CHRISTOPHER S.

Attitude maintenance using an off-boresight helmet-mounted virtual display p 183 N92-19022

CALL, D. W.

A kinematic model for predicting the effects of helmet mounted systems p 182 N92-19015

CARR, K. T.

The effects upon visual performance of varying binocular overlap p 182 N92-19016

CHELA-FLORES, J.

On the transition period from chemical to biological evolution [DE92-609049] p 159 N92-18132

CHENTSOVA, N. A.

Tyrosine hydroxylase activity in *Drosophila virilis* under normal conditions and heat stress p 158 A92-27494

CHERNENKO, A. I.

Biorhythmicity in decompression sickness p 163 A92-25957

CLARKE, A. L.

The effects upon visual performance of varying binocular overlap p 182 N92-19016

CLARKSON, G. J. N.

The design and evaluation of fast-jet helmet mounted displays p 181 N92-19010

CLERE, J. M.

Assisted positive pressure breathing: Effects on +Gz human tolerance in centrifuge p 170 N92-18985

CLERE, JEAN-MICHEL

French equipment for integrated protection of combat aircraft crews: Principles and tests at high altitudes p 180 N92-18994
Physiological protection equipment for combat aircraft: Integration of functions, principal technologies p 180 N92-18996

COHEN-ZARDY, D.

Circulatory biomechanics effects of accelerations p 171 N92-18991

COHEN, H. D.

Effects of methanol vapor on human neurobehavioral measures [PB91-243253] p 174 N92-19957

COLLINS, RICHARD

Assessment of physiological requirements for protection of the human cardiovascular system against high sustained gravitational stresses p 171 N92-18990

CONNELL, LINDA J.

Crew factors in flight operations. 8: Factors influencing sleep timing and subjective sleep quality in commercial long-haul flight crews [NASA-TM-103852] p 174 N92-19977

COOK, M. R.

Effects of methanol vapor on human neurobehavioral measures [PB91-243253] p 174 N92-19957

CORNWALL, MARK W.

The influence of high, sustained acceleration stress on electromyographic activity of the trunk and leg muscles p 170 N92-18980

COUNTRYMAN, PETER

Effect of increased axial field of view on the performance of a volume PET scanner [DE92-004424] p 173 N92-19877

CROFT, ROGER J.

The RAF Institute of Aviation Medicine proposed helmet fitting/retention system p 181 N92-19013

D**D'AUNNO, DOMINICK S.**

Intermittent acceleration as a countermeasure to soleus muscle atrophy p 158 A92-26548

DASILVA, M.

The effects of exercise on pharmacokinetics and pharmacodynamics of physostigmine in rats [AD-A241867] p 159 N92-18257

DAUMAS, T.

Circulatory biomechanics effects of accelerations p 171 N92-18991

DAVIS, ALISON A.

Novel major archaeobacterial group from marine plankton p 159 A92-28236

DEBENQUE, G.

Measurement of sight direction in a centrifuge. Part 2: Eye movement [REPT-1169/CEV/SE/LAMAS] p 172 N92-19255
Measurement of sight direction in a centrifuge. Part 1: Head movement [REPT-1168/CEV/SE/LAMAS] p 173 N92-19347

DEHART, ROY L.

Decompression sickness - An increasing risk for the private pilot p 165 A92-26335

DEKOCK, J. P.

Pulse oximetry: Theoretical and experimental models [OUEL-1885/91] p 168 N92-18339

DENISENKO, G. T.

The effect of the metabolic preparation Rikavit on the process of human adaptation to high altitudes p 166 A92-27499

DENISOV, V. N.

Glycemia as a risk factor of reduced tolerance to hypoxic hypoxia in flight personnel p 162 A92-25256

DESGRANGES, C.

Measurement of sight direction in a centrifuge. Part 2: Eye movement [REPT-1169/CEV/SE/LAMAS] p 172 N92-19255
Measurement of sight direction in a centrifuge. Part 1: Head movement [REPT-1168/CEV/SE/LAMAS] p 173 N92-19347

DESMOND, J. L.

Hemodynamic responses to pressure breathing during +Gz (PBG) in swine p 160 N92-18982

DETERMAN, DOUGLAS K.

Response devices and cognitive tasks [AD-A243903] p 176 N92-19365

DEVONAEV, O. T.

Dynamics of kidney tissue and vessel changes in white rats due to acute cold stress p 158 A92-27600

DIZARNY-GARGAS, L.

Measurement of sight direction in a centrifuge. Part 2: Eye movement [REPT-1169/CEV/SE/LAMAS] p 172 N92-19255

DMITRIUK, A. I.

The development of decompression regimens for excursion dives using data from prolonged exposures to 21 ata p 164 A92-26010

DONOHUE-PERRY, MARY M.

An evaluation of the protective integrated hood mask for ANVIS night vision goggle compatibility p 181 N92-19012

DROZD, I. V.

Prophylactic and sensitizing effects of biologically active substances in the simulation of vestibulovegetative disorders p 156 A92-25275

DRURAY, COLIN G.

Human factors in aviation maintenance, phase 1 [AD-A243844] p 184 N92-19808

DUBE, S. N.

The effects of exercise on pharmacokinetics and pharmacodynamics of physostigmine in rats [AD-A241867] p 159 N92-18257

DUBROVIN, A. P.

A method for determining levels of calcium in the hand using activated neutrons from (Pu-238)-Be sources p 177 A92-25273

DUDFIELD, HELEN J.

Helmet mounted displays: Human factors and fidelity p 183 N92-19021

DURNOVA, G. N.

The effect of weightlessness on healing of bone fractures in rats flown on the Cosmos-2044 biosatellite p 155 A92-25262

DVORIANINOVICH, L. N.

Some indices of protein and nucleic acid metabolism in the lymphoid organs of rats subjected to hypokinesia and to vitamin-B1 deficiency p 155 A92-25265

DYER, ROBERT S.

Evaluating the human health effects of hazardous wastes: Reproduction and development, neurotoxicity, genetic toxicity, and cancer [PB92-110352] p 173 N92-19702

E**EDGAR, G. K.**

The effects upon visual performance of varying binocular overlap p 182 N92-19016

EKELUND, L. G.

Effects of 4 percent and 6 percent carboxyhemoglobin on arrhythmia production in patients with coronary artery disease [PB91-243246] p 174 N92-19956

EL-FAKAHANY, ESAM E.

Regulation of brain muscarinic receptors by protein kinase C [AD-A244419] p 172 N92-19087

ERSHOV, A. F.

Estimating the organism's nonspecific resistance from individual reaction to hypoxic testing p 166 A92-27498

ETINGEN, L. E.

Dynamics of kidney tissue and vessel changes in white rats due to acute cold stress p 158 A92-27600

EVANS, LES

Fixed wing night attack EO integration and sensor fusion p 181 N92-19009

F**FANTON, J. W.**

Hemodynamic responses to pressure breathing during +Gz (PBG) in swine p 160 N92-18982

FARASHCHUK, N. F.

Studies of the biological activity of a nidus vespae extract in animals subjected to physical loads p 157 A92-26023

FARRELL, P. S. E.

Model of air flow in a multi-bladder physiological protection system p 180 N92-18997

FITZPATRICK, L.

The effects of exercise on pharmacokinetics and pharmacodynamics of physostigmine in rats [AD-A241867] p 159 N92-18257

FLORES, N. D.

Pathophysiology of spontaneous venous gas embolism [NASA-CR-189915] p 173 N92-19761

FOX, M. R.

Beneficial uses of radiation [DE92-003024] p 168 N92-18799

FRASER, W.

Finite element modeling of sustained +Gz acceleration induced stresses in the human ventricle myocardium p 172 N92-18992

FRASER, W. D.

Bubble nucleation threshold in deoxygenated plasma p 160 N92-18974

FREEMAN, JAMES

G-induced loss of consciousness accidents: USAF experience 1982-1990 p 169 N92-18977

FUHRMAN, JED A.

Novel major archaeobacterial group from marine plankton p 159 A92-28236

G**GAFFIE, D.**

G-LOC. Gz and brain hypoxia. Gz/s and intracranial hypertension p 170 N92-18984
Circulatory biomechanics effects of accelerations p 171 N92-18991

GANDER, PHILIPPA H.

Crew factors in flight operations. 8: Factors influencing sleep timing and subjective sleep quality in commercial long-haul flight crews [NASA-TM-103852] p 174 N92-19977

GEISELMAN, ERIC E.

Attitude maintenance using an off-boresight helmet-mounted virtual display p 183 N92-19022

GERKOVICH, M. M.

Effects of methanol vapor on human neurobehavioral measures [PB91-243253] p 174 N92-19957

GILBERT, JOHN H.

A method of evaluating efficiency during space-suited work in a neutral buoyancy environment [NASA-TP-3153] p 184 N92-19772

GILKEY, ROBERT H.

Binaural masking: An analysis of models [AD-A244392] p 168 N92-18859

GIRARDEAU, L.

Measurement of sight direction in a centrifuge. Part 2: Eye movement [REPT-1169/CEV/SE/LAMAS] p 172 N92-19255
Measurement of sight direction in a centrifuge. Part 1: Head movement [REPT-1168/CEV/SE/LAMAS] p 173 N92-19347

GLAISTER, DAVID H.

Pulmonary effects of high-G and positive pressure breathing p 169 N92-18978

GOETERS, KLAUS-MARTIN

The construction of personality questionnaires for selection of aviation personnel
[DLR-FB-91-18] p 176 N92-19410

GOLDENBERG, A. A.

Model of air flow in a multi-bladder physiological protection system p 180 N92-18997

GOLDING, JOHN F.

Phasic skin conductance activity and motion sickness p 165 A92-26329

GOLOVCHITS, V. N.

Use of air transport in delivering medical help to victims in the area of an earthquake epicenter p 163 A92-25956

GONCHAROV, I. B.

Hematologic indices in cosmonauts during a space flight p 163 A92-26006

GORA, ELENA P.

Hyperventilation
[ISBN 5-02-005854-8] p 163 A92-25401

GORANCHUK, V. V.

Some characteristics of humoral immunity and nonspecific resistance in pilots p 161 A92-25255

GORBATENKOVA, N. V.

The effect of a pulsed electromagnetic field on the accumulation of calcium ions by the sarcoplasmic reticulum of rat heart muscle p 156 A92-25270

GOROVOI, L. F.

Pileate mushrooms and algae - Objects for space biology p 156 A92-25402

GRADWELL, D. P.

The experimental assessment of new partial pressure assemblies p 180 N92-18995

GRAEBER, R. CURTIS

Crew factors in flight operations. 8: Factors influencing sleep timing and subjective sleep quality in commercial long-haul flight crews
[NASA-TM-103852] p 174 N92-19977

GRAHAM, C.

Effects of methanol vapor on human neurobehavioral measures
[PB91-243253] p 174 N92-19957

GRAPPERON, J.

Development of an electromyography and accelerometry ambulatory recording system
[CERB-91-07] p 184 N92-19926

GREENISEN, MICHAEL C.

A method of evaluating efficiency during space-suited work in a neutral buoyancy environment
[NASA-TP-3153] p 184 N92-19772

GREGORY, KEVIN B.

Crew factors in flight operations. 8: Factors influencing sleep timing and subjective sleep quality in commercial long-haul flight crews
[NASA-TM-103852] p 174 N92-19977

GRIFFITH, WILLIAM E.

Computer simulation model of cockpit crew coordination: A crew-level error model for the US Army's Blackhawk helicopter
[AD-A243618] p 178 N92-18009

GRIGOR'EV, A. I.

Assessment of the health status and the characteristics of metabolism in cosmonauts during a prolonged space flight p 165 A92-26018

GROISBERG, F. IA.

The characteristics of prolactin secretion in response to different degrees of vestibular-analyzer lesions p 165 A92-26017

GROMYKO, N. M.

Characteristics of behavioral reactions of rats exposed to constant electric fields of different voltage p 157 A92-26024

GUCCIONE, S. J., JR.

A kinematic model for predicting the effects of helmet mounted systems p 182 N92-19015

GUILLAUME, A.

G-LOC. Gz and brain hypoxia. Gz/s and intracranial hypertension p 170 N92-18984
Circulatory biomechanics effects of accelerations p 171 N92-18991

GUSEV, V. M.

The effect of various types of abnormalities of the cupuloendolymphatic system of the vestibular apparatus on the system's dynamic characteristics p 155 A92-25259

H**HADLEY, JILL A.**

Effects of a simulated microgravity model on cell structure and function in rat testis and epididymis p 158 A92-26549

HALL, JOSEPH C.

Effects of a simulated microgravity model on cell structure and function in rat testis and epididymis p 158 A92-26549

HARDING, RICHARD

G-induced loss of consciousness accidents: USAF experience 1982-1990 p 169 N92-18977

HARTLEY, J.

Maximum intra-thoracic pressure with PBG and AGSM [DCIEM-91-43] p 169 N92-18979

HAY, A. E.

The design and development of a full-cover partial pressure assembly for protection against high altitude and G p 180 N92-18998

HAYATI, S.

Supervisory telerobotics testbed for unstructured environments p 178 A92-26660

HAYMANN, J. PH.

G-LOC. Gz and brain hypoxia. Gz/s and intracranial hypertension p 170 N92-18984

HECHT, N. K.

Near-minimum-time control of a flexible manipulator p 178 A92-28150

HERBST, M. C.

Effects of 4 percent and 6 percent carboxyhemoglobin on arrhythmia production in patients with coronary artery disease
[PB91-243246] p 174 N92-19956

HINDERLITER, A. L.

Effects of 4 percent and 6 percent carboxyhemoglobin on arrhythmia production in patients with coronary artery disease
[PB91-243246] p 174 N92-19956

HINES, JOHN

The effect of head-down tilt and water immersion on intracranial pressure in nonhuman primates p 158 A92-26332

HOUK, VIRGINIA S.

Evaluating the human health effects of hazardous wastes: Reproduction and development, neurotoxicity, genetic toxicity, and cancer
[PB92-110352] p 173 N92-19702

HUGHES, P. K.

Aircrew tasks and cognitive complexity
[ARL-SYS-TM-150] p 178 N92-18051

I**IAKOVLEVA, I. P.**

The information content of some hormonal indices and cyclic nucleotides in the estimation and prediction of resistance to the effect of acute hypoxia in operators p 163 A92-25266

IL'IN, V. K.

Microbiological aspects of the environment of underwater habitats p 177 A92-26008

IL'INA-KAKUEVA, E. I.

The effect of weightlessness on the progress of muscle repair in rats flown on the Cosmos-2044 biosatellite p 155 A92-25261

IL'INA, S. L.

Functional changes in the cardiovascular system and their pharmacological correction during immersion in a diving suit p 164 A92-26013

INOZEMTSEV, S. L.

Some characteristics of the motor function of digestive organs in humans with different susceptibilities to motion sickness p 164 A92-26014

IOSELIANI, K. K.

Investigation of mental work capacity of cosmonauts aboard the Mir orbital complex p 175 A92-26005

ISAENKO, V. V.

External respiration and gas exchange in humans undergoing simulated diving at 350 m p 164 A92-26009

IUSUPOVA, SH. IU.

The characteristics of structural changes in membranes of the rectum of animals in the process of adaptation to high altitude p 159 A92-27635

IVANCHIKOV, A. P.

Glycemia as a risk factor of reduced tolerance to hypoxic hypoxia in flight personnel p 162 A92-25256

IVASHKEVICH, A. A.

The effect of the metabolic preparation Rikavit on the process of human adaptation to high altitudes p 166 A92-27499

J**JAMES, D. F.**

Model of air flow in a multi-bladder physiological protection system p 180 N92-18997

JARON, DOV

A cardiovascular model of G-stress effects: Preliminary studies with positive pressure breathing p 171 N92-18989

JOHNSON, WILLIAM B.

Human factors in aviation maintenance, phase 1
[AD-A243844] p 184 N92-19808

JUNKINS, J. L.

Near-minimum-time control of a flexible manipulator p 178 A92-28150

K**KALANDAROVA, M. P.**

Hematologic indices in cosmonauts during a space flight p 163 A92-26006

KALINKIN, S. V.

The information content of some hormonal indices and cyclic nucleotides in the estimation and prediction of resistance to the effect of acute hypoxia in operators p 163 A92-25266

KAPLANSKII, A. S.

The effect of weightlessness on healing of bone fractures in rats flown on the Cosmos-2044 biosatellite p 155 A92-25262

KARAVIS, A.

The design and evaluation of fast-jet helmet mounted displays p 181 N92-19010

KAREMAKER, J. M.

The Valsalva maneuver and its limited value in predicting +Gz-tolerance p 170 N92-18981

KARIN, M.

The molecular basis for UV response of cultured human cells
[DE92-003766] p 167 N92-18296

KARP, JOEL S.

Effect of increased axial field of view on the performance of a volume PET scanner
[DE92-004424] p 173 N92-19877

KASATKINA, T. B.

Pileate mushrooms and algae - Objects for space biology p 156 A92-25402

KAUFMAN, LLOYD

Attention, imagery and memory: A neuromagnetic investigation
[AD-A243859] p 175 N92-19069

KAZAKOVA, R. T.

The effects of isolated and combined exposures to a constant magnetic field and antithrostatic hypokinesia on the central hemodynamics in rats p 156 A92-25268

KEIL, LANNY C.

The effect of head-down tilt and water immersion on intracranial pressure in nonhuman primates p 158 A92-26332

KELLER, HANS JOERG

Organizational aspects for preventing human faults in space systems: Systems engineering approaches to total quality management
[MBB-UK-0139-91-PUB] p 179 N92-18481

KEMPTON, KAREN M.

A management proposal for determining the effects of combat stress on the man-machine interface of complex information display systems
[AD-A243422] p 178 N92-18080

KHAIDAKOV, K. S.

Role of external respiration in the formation of the autonomic component of motion sickness p 162 A92-25260

External respiration and gas exchange during space flights p 163 A92-26004

KHALANGOT, A. F.

Nuclease activity of microorganisms and the problem of monitoring the state of autotrophic flora in operators in hermetically sealed environments p 164 A92-26015

KHISAMBEV, SH. R.

Investigation of mental work capacity of cosmonauts aboard the Mir orbital complex p 175 A92-26005

KHLEBODAROVA, T. M.

Tyrosine hydroxylase activity in *Drosophila virilis* under normal conditions and heat stress p 158 A92-27494

KHOLIN, S. F.

A mathematical approach to the assessment of the accuracy of physiological parameter measurements performed by different methods p 157 A92-26020

KINAHAN, PAUL E.

Effect of increased axial field of view on the performance of a volume PET scanner
[DE92-004424] p 173 N92-19877

KLIMOVICH, V. V.

Some indices of protein and nucleic acid metabolism in the lymphoid organs of rats subjected to hypokinesia and to vitamin-B1 deficiency p 155 A92-25265

KLIMOVITSKII, V. IA.

The effect of a pulsed electromagnetic field on the accumulation of calcium ions by the sarcoplasmic reticulum of rat heart muscle p 156 A92-25270

KOLMAKOVA, T. S.

The characteristics of prolactin secretion in response to different degrees of vestibular-analyzer lesions p 165 A92-26017

KONDAKOV, A. V.

Functional state of the cardiovascular system in fighter pilots with mitral valve prolapse p 161 A92-25252

KONOSHENKO, S. V.

Functional properties of blood proteins in highly trained athletes p 162 A92-25258

KORDIUM, E. L.

Pileate mushrooms and algae - Objects for space biology p 156 A92-25402
Ultrastructural organization of chlorella cells cultivated on a solid medium in microgravity p 159 A92-28384

KORELO, A. M.

A method for determining levels of calcium in the hand using activated neutrons from (Pu-238)-Be sources p 177 A92-25273

KOSOLAPOV, O. A.

Psychophysiological training of multiseat-aircraft flight personnel for coordinating activities during emergency situations p 167 A92-27642

KOSTIUCHENKOV, V. N.

Studies of the biological activity of a nidus vespaee extract in animals subjected to physical loads p 157 A92-26023

KOTOV, A. N.

External respiration and gas exchange during space flights p 163 A92-26004

KOTOVSKAIA, A. R.

Tolerance to chest-to-back (+Gx) and head-to-feet (+Gz) overloads during drug-induced hypohydration p 161 A92-25253

KOVALENKO, V. P.

Physiological-hygienic aspects of increasing the heat resistance in humans (Review of the literature) p 161 A92-25251

KOZHARINOV, V. I.

Assessment of the health status and the characteristics of metabolism in cosmonauts during a prolonged space flight p 165 A92-26018

KRAUS, J. M.

Design methodology for a helmet display: Ergonomic aspects p 183 A92-19023

KRIVODAEVA, O. L.

Characteristics of behavioral reactions of rats exposed to constant electric fields of different voltage p 157 A92-26024

KROCK, LARRY P.

The influence of high, sustained acceleration stress on electromyographic activity of the trunk and leg muscles p 170 N92-18980

KROL, J.

The Valsalva maneuver and its limited value in predicting +Gz-tolerance p 170 N92-18981

KUCHERENKO, M. E.

Content and composition of free fatty acids in the sarcoplasmic reticulum membranes after exposure to ionizing radiation p 159 A92-28370

KUHL, D. E.

Radiopharmaceuticals for diagnosis and treatment [DE92-004065] p 167 N92-18102

KULESHOV, V. I.

Metabolic changes during hyperbaric oxygenation p 164 A92-26011

KUNITSYN, V. G.

Changes in the erythrocyte membranes and of Na(+), K(+)-ATPase in participants of the Canadian-Soviet trans-Arctic ski trek p 162 A92-25257

KUPSTAS, EILEEN

Automated protocol analysis: Tools and methodology [AD-A242040] p 175 N92-18245

KURAEVA, T. L.

Glycemia as a risk factor of reduced tolerance to hypoxic hypoxia in flight personnel p 162 A92-25256

L**LACROUX, P.**

Design methodology for a helmet display: Ergonomic aspects p 183 N92-19023

LAKOTA, N. G.

Functional changes in the cardiovascular system and their pharmacological correction during immersion in a diving suit p 164 A92-26013

LAMBERTSEN, C. J.

Pathophysiology of spontaneous venous gas embolism [NASA-CR-189915] p 173 N92-19761

LARINA, I. M.

Emergency deposition of calcium by plasma and nonplasma buffer systems - The effect of long-term hypokinesia p 162 A92-25264

LARINA, I. P.

Variations in the prostaglandin content and in some parameters of lipid metabolism in humans under conditions of prolonged hypokinesia p 162 A92-25263

LARINA, O. N.

Analysis of the protein content in blood plasma of rats after their flight aboard the biosatellite Cosmos-1887, using two-dimensional electrophoresis p 157 A92-26022

LEBEDEVA, T. E.

Biocatalysis using immobilized cells or enzymes as a method of water and air purification in a hermetically sealed habitat p 177 A92-26016

LEGER, A.

Biomechanical response of the head to G+ accelerations: Benefit for studies in combat simulators p 182 N92-19014

Design methodology for a helmet display: Ergonomic aspects p 183 N92-19023

Measurement of sight direction in a centrifuge. Part 1: Head movement [REPT-1168/CEV/SE/LAMAS] p 173 N92-19347

LEGER, ALAIN

Restriction of the field of vision: Influence on eye-head coordination during orientation towards an eccentric target p 182 N92-19017

LEGER, C. A.

Measurement of sight direction in a centrifuge. Part 2: Eye movement [REPT-1169/CEV/SE/LAMAS] p 172 N92-19255

LEGEZA, V. I.

The primary-reaction syndrome caused by a radiation exposure (Review of the literature) p 166 A92-27629

LEJEUNE, DAMIEN

French equipment for integrated protection of combat aircraft crews: Principles and tests at high altitudes p 180 N92-18994

Physiological protection equipment for combat aircraft: Integration of functions, principal technologies p 180 N92-18996

LERNER, FRED

PILOTS: User's guide [PB92-100262] p 173 N92-19689

LEVACHEV, M. M.

Functional properties of blood proteins in highly trained athletes p 162 A92-25258

LIEBAERT, PH.

G-LOC. Gz and brain hypoxia. Gz/s and intracranial hypertension p 170 N92-18984

Circulatory biomechanics effects of accelerations p 171 N92-18991

LIPOVENKO, S. N.

Night-sleep pattern and the susceptibility to motion sickness p 163 A92-25274

LITOVCHENKO, V. V.

Use of air transport in delivering medical help to victims in the area of an earthquake epicenter p 163 A92-25956

LIVINGSTONE, SYDNEY D.

Investigation of the effect of cooling the feet as a means of reducing thermal stress [AD-A244264] p 172 N92-19333

LOGINOV, V. A.

The effect of a pulsed electromagnetic field on the accumulation of calcium ions by the sarcoplasmic reticulum of rat heart muscle p 156 A92-25270

LORENZO, F.

Development of an electromyography and accelerometry ambulatory recording system [CERB-91-07] p 184 N92-19926

LOVETT, NIGEL P. J.

Advances in the design of military aircrew breathing systems with respect to high altitude and high acceleration conditions p 180 N92-18999

LUK'IANIUK, V. IU.

Tolerance to chest-to-back (+Gx) and head-to-feet (+Gz) overloads during drug-induced hypohydration p 161 A92-25253

LUPINOVICH, V. L.

Functional properties of blood proteins in highly trained athletes p 162 A92-25258

LYONS, TERENCE J.

G-induced loss of consciousness accidents: USAF experience 1982-1990 p 169 N92-18977

M**MACMILLAN, A. J. F.**

Physiological requirements for partial pressure assemblies for altitude protection p 179 N92-18993

High altitude high acceleration and NBC warfare protective system for advanced fighter aircraft: Design considerations p 181 N92-19000

MAKSIMOVA, E. N.

Basic approaches to spacecraft studies of the biological effect of heavy ions of galactic cosmic rays p 157 A92-26021

MALKIN, VIKTOR B.

Hyperventilation [ISBN 5-02-005854-8] p 163 A92-25401

MANTON, J. G.

Aircrew tasks and cognitive complexity [ARL-SYS-TM-150] p 178 N92-18051

MARKIN, A. S.

Role of external respiration in the formation of the autonomic component of motion sickness p 162 A92-25260

MAROTTE, HENRI

French equipment for integrated protection of combat aircraft crews: Principles and tests at high altitudes p 180 N92-18994

Physiological protection equipment for combat aircraft: Integration of functions, principal technologies p 180 N92-18996

MARSHALL, A. A.

The Military Aircrew Head Support System (MAHSS) p 179 N92-18988

MASHINS'KII, O. L.

Ultrastructural organization of chlorella cells cultivated on a solid medium in microgravity p 159 A92-28384

MATEEVA, EMILIA

Assessment of physiological requirements for protection of the human cardiovascular system against high sustained gravitational stresses p 171 N92-18990

MATSNEV, E. I.

Role of external respiration in the formation of the autonomic component of motion sickness p 162 A92-25260

MCARDLE, WILLIAM D.

Thermal responses during extended water immersion: Comparisons of rest and exercise, and levels of immersion [AD-A244305] p 172 N92-19031

MCCALLUM, KIRK

Novel major archaeobacterial group from marine plankton p 159 A92-28236

MCCLOSKEY, KATHY

Subjective reports concerning assisted positive pressure breathing under high sustained acceleration p 170 N92-18983

MCCULLOUGH, D.

Bubble nucleation threshold in deoxygenated plasma p 160 N92-18974

MCFARLANE, C.

Two different approaches for control and measurement of plant functions in closed environmental chambers [PB92-108067] p 161 N92-19911

MCKEEVER, KENNETH H.

The effect of head-down tilt and water immersion on intracranial pressure in nonhuman primates p 158 A92-26332

MEDVEDEV, F. A.

Functional properties of blood proteins in highly trained athletes p 162 A92-25258

MEDVEDEV, L. G.

Metabolic changes during hyperbaric oxygenation p 164 A92-26011

MEEKER, L. J.

Effects on Gz endurance/tolerance of reduced pressure schedules using the Advanced Technology Anti-G Suite (ATAGS) p 171 N92-18987

MEKJAVIC, IGOR B.

Temperature and humidity within the clothing microenvironment p 177 A92-26333

MENU, JEAN-PIERRE

Does the future lie in binocular helmet display? p 183 N92-19019

MERKULOV, V. M.

Glycemia as a risk factor of reduced tolerance to hypoxic hypoxia in flight personnel p 162 A92-25256

MIKHENKO, A. E.

External respiration and gas exchange in humans undergoing simulated diving at 350 m p 164 A92-26009

MINASIAN, S. M.

The role of specific and nonspecific afferent systems in the mechanism of changes in cortical evoked responses to vibration p 158 A92-26025

MINKOVA, M. I.

Protection from effects of radiation at sublethal doses during exposures to hypergravitation p 156 A92-25276

MODIN, A. IU.

Functional changes in the cardiovascular system and their pharmacological correction during immersion in a diving suit p 164 A92-26013

MOORE, J.

Finite element modeling of sustained +Gz acceleration induced stresses in the human ventricle myocardium
p 172 N92-18992

MOORE, THOMAS W.

A cardiovascular model of G-stress effects: Preliminary studies with positive pressure breathing
p 171 N92-18989

MORUKOV, B. V.

A method for determining levels of calcium in the hand using activated neutrons from (Pu-238)-Be sources
p 177 A92-25273

MUEHLEHNER, GERD

Effect of increased axial field of view on the performance of a volume PET scanner
[DE92-004424] p 173 N92-19877

N**NAIDINA, V. P.**

Variations in the prostaglandin content and in some parameters of lipid metabolism in humans under conditions of prolonged hypokinesia
p 162 A92-25263

NAISH, PETER L. N.

Helmet mounted displays: Human factors and fidelity
p 183 N92-19021

NARINSKAIA, A. L.

Investigation of mental work capacity of cosmonauts aboard the Mir orbital complex
p 175 A92-26005

NASH, CAROLYN

Design of helicopter night pilotage sensors: Lessons learned from recent flight experiments and field assessments
p 183 N92-19020

NAZAROV, N. M.

Biocatalysis using immobilized cells or enzymes as a method of water and air purification in a hermetically sealed habitat
p 177 A92-26016

NECHITAIO, G. S.

Ultrastructural organization of chlorella cells cultivated on a solid medium in microgravity
p 159 A92-28384

NEKRASOVA, M. F.

Changes in the erythrocyte membranes and of Na(+), K(+)-ATPase in participants of the Canadian-Soviet trans-Arctic ski trek
p 162 A92-25257

NESTERENKO, E. N.

The characteristics of prolactin secretion in response to different degrees of vestibular-analyzer lesions
p 165 A92-26017

NEVZGODINA, L. V.

Basic approaches to spacecraft studies of the biological effect of heavy ions of galactic cosmic rays
p 157 A92-26021

NEWTON, FREDERICK K.

A method of evaluating efficiency during space-suited work in a neutral buoyancy environment
[NASA-TP-3153] p 184 N92-19772

NIERZWICKI-BAUER, S. A.

Phylogenetic relationships among subsurface microorganisms
[DE92-004421] p 159 N92-18113

NIKOLENKO, O. V.

Functional properties of blood proteins in highly trained athletes
p 162 A92-25258

NOLAN, RICHARD W.

Investigation of the effect of cooling the feet as a means of reducing thermal stress
[AD-A244264] p 172 N92-19333

NORKINA, T. IU.

Microbiological aspects of the environment of underwater habitats
p 177 A92-26008

NOSKOV, V. B.

Tolerance to chest-to-back (+Gx) and head-to-feet (+Gz) overloads during drug-induced hypohydration
p 161 A92-25253

Assessment of the health status and the characteristics of metabolism in cosmonauts during a prolonged space flight
p 165 A92-26018

NOSOVSKII, A. M.

A mathematical approach to the assessment of the accuracy of physiological parameter measurements performed by different methods
p 157 A92-26020

O**O'BRIEN, AMI**

Effects of a simulated microgravity model on cell structure and function in rat testis and epididymis
p 158 A92-26549

OKLEY, CAROLYN

G-induced loss of consciousness accidents: USAF experience 1982-1990
p 169 N92-18977

ORLOV, I. V.

The effect of various types of abnormalities of the cupuloendolymphatic system of the vestibular apparatus on the system's dynamic characteristics
p 155 A92-25259

OS'MININ, F. V.

Estimating the organism's nonspecific resistance from individual reaction to hypoxic testing
p 166 A92-27498

OSGOOD, ROBERT K.

The effect of field-of-view size on performance of a simulated air-to-ground night attack
p 182 N92-19018

Attitude maintenance using an off-boresight helmet-mounted virtual display
p 183 N92-19022

P**PAGE, J.**

The effects upon visual performance of varying binocular overlap
p 182 N92-19016

PANIN, L. E.

Changes in the erythrocyte membranes and of Na(+), K(+)-ATPase in participants of the Canadian-Soviet trans-Arctic ski trek
p 162 A92-25257

PANTEV, T. P.

Protection from effects of radiation at sublethal doses during exposures to hypergravitation
p 156 A92-25276

PARKER, IAN

Arm of the future
p 178 A92-27373

PAYER, H. D.

Two different approaches for control and measurement of plant functions in closed environmental chambers
[PB92-108067] p 161 N92-19911

PECARIC, M.

Maximum intra-thoracic pressure with PBG and AGSM [DCIEM-91-43]
p 169 N92-18979

PERKOVSKII, A. V.

A method for a comprehensive assessment of technical equipment for the medical compartment of a spacecraft
p 177 A92-26019

PETROVA, T. V.

The information content of some hormonal indices and cyclic nucleotides in the estimation and prediction of resistance to the effect of acute hypoxia in operators
p 163 A92-25266

PFLEGER, T.

Two different approaches for control and measurement of plant functions in closed environmental chambers
[PB92-108067] p 161 N92-19911

PIKALOV, A. A.

Psychophysiological training of multiseat-aircraft flight personnel for coordinating activities during emergency situations
p 167 A92-27642

PILMANIS, ANDREW A.

Decompression sickness and ebullism at high altitudes
p 169 N92-18973

The 1990 Hypobaric Decompression Sickness Workshop: Summary and Conclusions
p 169 N92-18975

Prebreathing as a means to decrease the incidence of decompression sickness at altitude
p 169 N92-18976

PISANKO, A. P.

Estimating the organism's nonspecific resistance from individual reaction to hypoxic testing
p 166 A92-27498

PISARELLO, J. B.

Pathophysiology of spontaneous venous gas embolism
[NASA-CR-189915] p 173 N92-19761

PISHCHALENKO, A. N.

The effect of the metabolic preparation Rikavit on the process of human adaptation to high altitudes
p 166 A92-27499

PITTET, S. C. P.

Development of an electromyography and accelerometry ambulatory recording system
[CERB-91-07] p 184 N92-19926

PLANTIER, JUSTIN

Does the future lie in binocular helmet display?
p 183 N92-19019

POGORELOV, I. A.

Biorhythmicity in decompression sickness
p 163 A92-25957

POLESHCHUK, I. P.

The development of decompression regimens for excursion dives using data from prolonged exposures to 21 ata
p 164 A92-26010

POLIAKOV, B. I.

Some characteristics of the motor function of digestive organs in humans with different susceptibilities to motion sickness
p 164 A92-26014

POLIAKOV, V. V.

Hematologic indices in cosmonauts during a space flight
p 163 A92-26006

Assessment of the health status and the characteristics of metabolism in cosmonauts during a prolonged space flight
p 165 A92-26018

POLIKARPOV, N. A.

Microbiological aspects of the environment of underwater habitats
p 177 A92-26008

Nuclease activity of microorganisms and the problem of monitoring the state of automicroflora in operators in hermetically sealed environments
p 164 A92-26015

POPOVA, A. F.

Pileate mushrooms and algae - Objects for space biology
p 156 A92-25402

Ultrastructural organization of chlorella cells cultivated on a solid medium in microgravity
p 159 A92-28384

POPPER, STEPHEN E.

Subjective reports concerning assisted positive pressure breathing under high sustained acceleration
p 170 N92-18983

POSOKHOV, S. I.

Analysis of the stages of the night sleep of human subjects from the standpoint of the functional quantization of the vital activity
p 166 A92-27504

PRAVETSKII, N. V.

A mathematical approach to the assessment of the accuracy of physiological parameter measurements performed by different methods
p 157 A92-26020

PRESTON, DAVID R.

Technology assessment and strategy for development of a rapid field water microbiology test kit
[AD-A243413] p 167 N92-18076

PRIOR, A. R. J.

The optimisation of a positive pressure breathing system for enhanced G protection
p 171 N92-18986

PROTASOV, K. T.

Estimating the organism's nonspecific resistance from individual reaction to hypoxic testing
p 166 A92-27498

PUKO, V. M.

Prophylactic and sensitizing effects of biologically active substances in the simulation of vestibulovegetative disorders
p 156 A92-25275

PUSEY, MARC L.

The solubility of the tetragonal form of hen egg white lysozyme from pH 4.0 to 5.4
p 157 A92-25429

Q**QUANDIEU, P.**

G-LOC. Gz and brain hypoxia. Gz/s and intracranial hypertension
p 170 N92-18984

Circulatory biomechanics effects of accelerations
p 171 N92-18991

QUANT, JULIE R.

The effect of sleep deprivation and sustained military operations on near visual performance
p 175 A92-26330

R**RADKOVSKI, G.**

Investigation of mental work capacity of cosmonauts aboard the Mir orbital complex
p 175 A92-26005

RAUSHENBAKH, I. IU.

Tyrosine hydroxylase activity in Drosophila virilis under normal conditions and heat stress
p 158 A92-27494

RAYMAN, RUSSELL B.

Clinical aviation medicine (2nd revised and enlarged edition)
[ISBN 0-8121-1248-2] p 165 A92-26700

RAZUMOV, A. N.

Psychophysiological training of multiseat-aircraft flight personnel for coordinating activities during emergency situations
p 167 A92-27642

REITER, LAWRENCE W.

Evaluating the human health effects of hazardous wastes: Reproduction and development, neurotoxicity, genetic toxicity, and cancer
[PB92-110352] p 173 N92-19702

REPPERGER, DANIEL W.

Subjective reports concerning assisted positive pressure breathing under high sustained acceleration
p 170 N92-18983

RIEGLER, JOSEPH T.

An evaluation of the protective integrated hood mask for ANVIS night vision goggle compatibility
p 181 N92-19012

ROBERTSON-DEMERS, K. A.

Effects of liquid desiccants on airborne microorganisms: Laboratory set up, procedure development, and preliminary measurements
[DE92-004749] p 160 N92-19636

ROBINSON, RONALD R.

Intermittent acceleration as a countermeasure to soleus muscle atrophy
p 158 A92-26548

RODCHENKOV, S. V.

The development of decompression regimens for excursion dives using data from prolonged exposures to 21 ata p 164 A92-26010

ROGOV, V. A.

Some characteristics of the motor function of digestive organs in humans with different susceptibilities to motion sickness p 164 A92-26014

ROUMES, CORINNE

Does the future lie in binocular helmet display? p 183 N92-19019

RUBIN, H.

Mechanisms of action of heavy metals and asbestos on cultured animal cells: Adaptation, transformation and progression [DE92-004101] p 160 N92-18887

RUDGE, FREDERICK W.

Altitude-induced arterial gas embolism - A case report p 165 A92-26336

RUVINOVA, L. G.

Some characteristics of the motor function of digestive organs in humans with different susceptibilities to motion sickness p 164 A92-26014

S

SAKIAN, S. G.

The role of specific and nonspecific afferent systems in the mechanism of changes in cortical evoked responses to vibration p 158 A92-26025

SABKO, V. S.

Content and composition of free fatty acids in the sarcoplasmic reticulum membranes after exposure to ionizing radiation p 159 A92-26370

SAKHARCHUK, I. I.

The effect of the metabolic preparation Rikavit on the process of human adaptation to high altitudes p 166 A92-27499

SANDOR, P.

Biomechanical response of the head to G+ accelerations: Benefit for studies in combat simulators p 182 N92-19014

SANDOR, PATRICK

Restriction of the field of vision: Influence on eye-head coordination during orientation towards an eccentric target p 182 N92-19017

SARRON, J. C.

G-LOC. Gz and brain hypoxia. Gz/s and intracranial hypertension p 170 N92-18984

SAVCHENKO, G. E.

External respiration and gas exchange during space flights p 163 A92-26004

SAVCHENKO, N. IA.

Functional state of the CNS at an early period of the development of radiation sickness after irradiation with helium ions p 155 A92-25267

SCHAUB, STEPHEN A.

Technology assessment and strategy for development of a rapid field water microbiology test kit [AD-A243413] p 167 N92-18076

SCHMOLKE, W.

Two different approaches for control and measurement of plant functions in closed environmental chambers [PB92-108067] p 161 N92-19911

SCHREYER, HERBERT

Helicopter integrated helmet requirements and test results p 181 N92-19011

SEBASTIAN, LISA A.

Influences of chemical sympathectomy, demedullation, and hindlimb suspension on the V(O₂)max of rats p 158 A92-26334

SEREBROVSKAIA, T. V.

The effect of the metabolic preparation Rikavit on the process of human adaptation to high altitudes p 166 A92-27499

SEREDENKO, M. M.

The effect of the metabolic preparation Rikavit on the process of human adaptation to high altitudes p 166 A92-27499

SEROVA, L. I.

Tyrosine hydroxylase activity in *Drosophila virilis* under normal conditions and heat stress p 158 A92-27494

SEVERS, WALTER B.

The effect of head-down tilt and water immersion on intracranial pressure in nonhuman primates p 158 A92-26332

SEVILLA, M. D.

Mechanisms for radiation damage in DNA [DE91-019080] p 167 N92-18025

SHARIPOV, F. KH.

Mechanisms for radiation damage in DNA [DE91-019079] p 168 N92-18419

SHARIPPOV, F. KH.

Dynamics of kidney tissue and vessel changes in white rats due to acute cold stress p 158 A92-27600

The characteristics of structural changes in membranes of the rectum of animals in the process of adaptation to high altitude p 159 A92-27635

SHASHKOV, V. S.

Prophylactic and sensitizing effects of biologically active substances in the simulation of vestibulovegetative disorders p 156 A92-25275

Functional changes in the cardiovascular system and their pharmacological correction during immersion in a diving suit p 164 A92-26013

SHEPHERD, WILLIAM T.

Human factors in aviation maintenance, phase 1 [AD-A243844] p 184 N92-19808

SHEPS, D. S.

Effects of 4 percent and 6 percent carboxyhemoglobin on arrhythmia production in patients with coronary artery disease [PB91-243246] p 174 N92-19956

SHEVCHENKO, S. B.

Metabolic changes during hyperbaric oxygenation p 164 A92-26011

SHIMANOVICH, E. G.

Biorhythmicity in decompression sickness p 163 A92-25957

SHUMNAIA, L. V.

Tyrosine hydroxylase activity in *Drosophila virilis* under normal conditions and heat stress p 158 A92-27494

SIEGBORN, J.

G-endurance during heat stress and balanced pressure breathing p 165 A92-26331

SIMONS, M.

The Valsalva maneuver and its limited value in predicting +Gz-tolerance p 170 N92-18981

SINIAK, IU. E.

Biocatalysis using immobilized cells or enzymes as a method of water and air purification in a hermetically sealed habitat p 177 A92-26016

SITNIK, K. M.

Ultrastructural organization of chlorella cells cultivated on a solid medium in microgravity p 159 A92-26384

SKIDMORE, MICHAEL G.

The effect of head-down tilt and water immersion on intracranial pressure in nonhuman primates p 158 A92-26332

SKORNIKOV, V. V.

Physiological-hygienic aspects of increasing the heat resistance in humans (Review of the literature) p 161 A92-25251

SKUDIN, V. K.

The development of decompression regimens for excursion dives using data from prolonged exposures to 21 ata p 164 A92-26010

SLEDKOV, A. IU.

The grooming and motor activities of rats under conditions of hyperbaria p 157 A92-26012

SMIRNOV, V. S.

Some characteristics of humoral immunity and nonspecific resistance in pilots p 161 A92-25255

SMIRNOVA, O. A.

Investigation of the cyclic kinetics of immunity by mathematical modeling methods p 156 A92-25271

SMIRNOVA, T. M.

Emergency deposition of calcium by plasma and nonplasma buffer systems - The effect of long-term hypokinesia p 162 A92-25264

SMITH, DANA K.

Automated protocol analysis: Tools and methodology [AD-A242040] p 175 N92-18245

SMITH, GREGORY S.

Intermittent acceleration as a countermeasure to soleus muscle atrophy p 158 A92-26548

SMITH, JOHN B.

Automated protocol analysis: Tools and methodology [AD-A242040] p 175 N92-18245

SMITH, ROBERT E.

Chemical hazards database and detection system for Microgravity and Materials Processing Facility (MMPF) [NASA-CR-184274] p 179 N92-18927

SOBOLEVSKII, V. G.

Microbiological aspects of the environment of underwater habitats p 177 A92-26008

SOKOLOVA, T. V.

Tolerance to chest-to-back (+Gx) and head-to-feet (+Gz) overloads during drug-induced hypohydration p 161 A92-25253

SOMANI, S. M.

The effects of exercise on pharmacokinetics and pharmacodynamics of physostigmine in rats [AD-A241867] p 159 N92-18257

SQUIRES, WILLIAM G.

A method of evaluating efficiency during space-suited work in a neutral buoyancy environment [NASA-TP-3153] p 184 N92-19772

STEELE, JIMMY

Chemical hazards database and detection system for Microgravity and Materials Processing Facility (MMPF) [NASA-CR-184274] p 179 N92-18927

STEFANIK, RAYMOND J.

Comparison of second and third generation night vision goggles in time-limited scenarios [AD-A244330] p 184 N92-19447

STEGMANN, BARBARA J.

Decompression sickness and ebullism at high altitudes p 169 N92-18973

Prebreathing as a means to decrease the incidence of decompression sickness at altitude p 169 N92-18976

STEPANOV, IU. V.

Content and composition of free fatty acids in the sarcoplasmic reticulum membranes after exposure to ionizing radiation p 159 A92-26370

STEWART, JOHN E., II

Computer simulation model of cockpit crew coordination: A crew-level error model for the US Army's Blackhawk helicopter [AD-A243618] p 178 N92-18009

STRUBE, D.

Two different approaches for control and measurement of plant functions in closed environmental chambers [PB92-108067] p 161 N92-19911

STRZELECKI, JOSEPH P.

Horizontal impact tests of the Advanced Dynamic Anthropomorphic Manikin (ADAM) [AD-A243857] p 184 N92-19829

STUMP, CRAIG S.

Influences of chemical sympathectomy, demedullation, and hindlimb suspension on the V(O₂)max of rats p 158 A92-26334

SUKHANOV, IU. V.

Variations in the prostaglandin content and in some parameters of lipid metabolism in humans under conditions of prolonged hypokinesia p 162 A92-25263

Emergency deposition of calcium by plasma and nonplasma buffer systems - The effect of long-term hypokinesia p 162 A92-25264

SUKHORUKOV, O. A.

An experimental study of the effect of high pressure on the adsorption properties of silochrome C-120 p 177 A92-25269

SULLIVAN, PATRICK J.

Temperature and humidity within the clothing microenvironment p 177 A92-26333

SUVOROV, A. V.

External respiration and gas exchange in humans undergoing simulated diving at 350 m p 164 A92-26009

SYSOEV, A. B.

Microbiological aspects of the environment of underwater habitats p 177 A92-26008

T

TABARROK, B.

Finite element modeling of sustained +Gz acceleration induced stresses in the human ventricle myocardium p 172 N92-18992

TARASSENKO, L.

Pulse oximetry: Theoretical and experimental models [OUEL-1885/91] p 168 N92-18339

TAYLOR, JAMES C.

Human factors in aviation maintenance, phase 1 [AD-A243844] p 184 N92-19808

THOMASON, DONALD B.

Intermittent acceleration as a countermeasure to soleus muscle atrophy p 158 A92-26548

TIKHONOV, M. A.

Role of external respiration in the formation of the autonomic component of motion sickness p 162 A92-25260

External respiration and gas exchange during space flights p 163 A92-26004

TIKHONOVA, L. IU.

Hematologic indices in cosmonauts during a space flight p 163 A92-26006

TIMMERMANN, BERND

The construction of personality questionnaires for selection of aviation personnel [DLR-FB-91-18] p 176 N92-19410

TIPTON, CHARLES M.

Influences of chemical sympathectomy, demedullation, and hindlimb suspension on the V(O₂)max of rats p 158 A92-26334

TOLKACHEVA, N. V.

Functional properties of blood proteins in highly trained athletes p 162 A92-25258

TONER, MICHAEL M.

Thermal responses during extended water immersion:
Comparisons of rest and exercise, and levels of
immersion p 172 N92-19031
[AD-A244305]

TRAN, D.

G-LOC. Gz and brain hypoxia. Gz/s and intracranial
hypertension p 170 N92-18984

TRIPP, LLOYD D.

Subjective reports concerning assisted positive pressure
breathing under high sustained acceleration p 170 N92-18983

TROUSSET, A.

Development of an electromyography and
accelerometry ambulatory recording system p 184 N92-19926
[CERB-91-07]

U**UHR, LEONARD**

Behavior and learning in networks with differing amounts
of structure p 176 N92-19083
[AD-A244080]

ULTMAN, J. S.

Noninvasive determination of respiratory ozone
absorption: Development of a fast-responding ozone
analyzer p 173 N92-19952
[PB91-243220]

V**VAGIN, IU. E.**

Analysis of the stages of the night sleep of human
subjects from the standpoint of the functional quantization
of the vital activity p 166 A92-27504

VANLIESHOUT, E. J.

The Valsalva maneuver and its limited value in predicting
+Gz-tolerance p 170 N92-18981

VANLIESHOUT, J. J.

The Valsalva maneuver and its limited value in predicting
+Gz-tolerance p 170 N92-18981

VARTBARONOV, R. A.

Responses of the regional vessel tonus to the effects
of orthostatic and gravitational loads p 161 A92-25254

VIDAL, F.

Development of an electromyography and
accelerometry ambulatory recording system p 184 N92-19926
[CERB-91-07]

VEILLEFOND, HENRI

French equipment for integrated protection of combat
aircraft crews: Principles and tests at high altitudes p 180 N92-18994

VIEWRES, PIERRE

A cardiovascular model of G-stress effects: Preliminary
studies with positive pressure breathing p 171 N92-18989

VIKTOROV, A. N.

Microbiological aspects of the environment of
underwater habitats p 177 A92-26008
Nuclease activity of microorganisms and the problem
of monitoring the state of automicroflora in operators in
hermetically sealed environments p 164 A92-26015

VILLARD, D.

Development of an electromyography and
accelerometry ambulatory recording system p 184 N92-19926
[CERB-91-07]

VOGT, BRENT A.

Receptor subtype alterations: Bases of neuronal
plasticity and learning p 176 N92-19799
[AD-A244406]

VOITSITS'KII, V. M.

Content and composition of free fatty acids in the
sarcoplasmic reticulum membranes after exposure to
ionizing radiation p 159 A92-28370

VOL'F, N. V.

Dynamics of competing interaction between verbal and
manual activities during adaptation and readaptation after
transmeridional flight p 166 A92-27500

VOLKOV, M. IU.

Role of external respiration in the formation of the
autonomic component of motion sickness p 162 A92-25260
External respiration and gas exchange during space
flights p 163 A92-26004

VOLLMERHAUSEN, RICHARD

Design of helicopter night pilotage sensors: Lessons
learned from recent flight experiments and field
assessments p 183 N92-19020

VONBOEHM, HANS-DIETER

Helicopter integrated helmet requirements and test
results p 181 N92-19011

VORONIN, L. I.

A model of the pilot's perception of the perturbed angular
motion of the cockpit as part of the pilot's information
model p 177 A92-26007

VOROTNIKOVA, E. V.

The effect of weightlessness on healing of bone
fractures in rats flown on the Cosmos-2044 biosatellite
p 155 A92-25262

W**WALSH, WILLIAM J.**

Characterization of Air Force training and
computer-based training systems p 176 N92-19364
[AD-A243781]

WARD, C. A.

Bubble nucleation threshold in decomplemented
plasma p 160 N92-18974

WATKINS, TERRY A.

A kinematic model for predicting the effects of helmet
mounted systems p 182 N92-19015

WEISS, M. S.

A kinematic model for predicting the effects of helmet
mounted systems p 182 N92-19015

WELLS, MAXWELL J.

The effect of field-of-view size on performance of a
simulated air-to-ground night attack p 182 N92-19018

WEST, PHILLIP

A method of evaluating efficiency during space-suited
work in a neutral buoyancy environment p 184 N92-19772
[NASA-TP-3153]

WHONG, W. Z.

Development of a lung-cell model for studying workplace
genotoxicants p 174 N92-20020
[PB92-114644]

WILLIAMS, M.

The effects upon visual performance of varying binocular
overlap p 182 N92-19016

WILLIAMSON, SAMUEL J.

Attention, imagery and memory: A neuromagnetic
investigation p 175 N92-19069
[AD-A243859]

WOLPAW, JONATHAN R.

Activity-driven CNS changes in learning and
development p 175 N92-19064
[AD-A243790]

WOODMAN, CHRISTOPHER R.

Influences of chemical sympathectomy, demedullation,
and hindlimb suspension on the V(O₂)max of rats p 158 A92-26334

Y**YEE, D.**

Bubble nucleation threshold in decomplemented
plasma p 160 N92-18974

YEE, PATRICIA J.

Characterization of Air Force training and
computer-based training systems p 176 N92-19364
[AD-A243781]

YOON, K. J.

Retention modeling of diesel exhaust particles in rats
and humans p 173 N92-19954
[PB91-243238]

YOUNG, STEVEN A.

Characterization of Air Force training and
computer-based training systems p 176 N92-19364
[AD-A243781]

YU, C. P.

Retention modeling of diesel exhaust particles in rats
and humans p 173 N92-19954
[PB91-243238]

Z**ZAICHIK, V. E.**

A method for determining levels of calcium in the hand
using activated neutrons from (Pu-238)-Be sources p 177 A92-25273

ZAKHAROV, V. P.

Functional state of the cardiovascular system in fighter
pilots with mitral valve prolapse p 161 A92-25252

ZAPATA, RICHARD

Physiological protection equipment for combat aircraft:
Integration of functions, principal technologies p 180 N92-18996

ZHARKOVSKAIA, E. E.

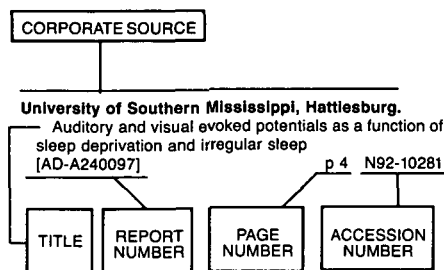
Variations in the prostaglandin content and in some
parameters of lipid metabolism in humans under conditions
of prolonged hypokinesia p 162 A92-25263

CORPORATE SOURCE INDEX

AEROSPACE MEDICINE AND BIOLOGY / A Continuing Bibliography (Supplement 363)

June 1992

Typical Corporate Source Index Listing



Listings in this index are arranged alphabetically by corporate source. The title of the document is used to provide a brief description of the subject matter. The page number and the accession number are included in each entry to assist the user in locating the abstract in the abstract section. If applicable, a report number is also included as an aid in identifying the document.

A

Advisory Group for Aerospace Research and Development, Neuilly-Sur-Seine (France).

High Altitude and High Acceleration Protection for Military Aircrew
[AGARD-CP-516] p 168 N92-18972
Helmet Mounted Displays and Night Vision Goggles
[AGARD-CP-517] p 181 N92-19008
Human performance assessment methods
[AGARD-AG-308] p 176 N92-20037

Aeronautical Research Labs., Melbourne (Australia).

Aircrew tasks and cognitive complexity
[ARL-SYS-TM-150] p 178 N92-18051

Aerospace Medical Research Labs., Wright-Patterson AFB, OH.

An evaluation of the protective integrated hood mask for ANVIS night vision goggle compatibility
p 181 N92-19012

The effect of field-of-view size on performance of a simulated air-to-ground night attack
p 182 N92-19018

Attitude maintenance using an off-boresight helmet-mounted virtual display
p 183 N92-19022

Horizontal impact tests of the Advanced Dynamic Anthropomorphic Manikin (ADAM)
[AD-A243857] p 184 N92-19829

Air Force Inspection and Safety Center, Norton AFB, CA.

G-induced loss of consciousness accidents: USAF experience 1982-1990
p 169 N92-18977

Air Force Inst. of Tech., Wright-Patterson AFB, OH.

Application of finite element modeling and analysis to the design of positive pressure oxygen masks
[AD-A244045] p 184 N92-19179

Air Force Systems Command, Brooks AFB, TX.

Decompression sickness and ebullism at high altitudes
p 169 N92-18973

The 1990 Hypobaric Decompression Sickness Workshop: Summary and Conclusions
p 169 N92-18975

G-induced loss of consciousness accidents: USAF experience 1982-1990
p 169 N92-18977

The influence of high, sustained acceleration stress on electromyographic activity of the trunk and leg muscles
p 170 N92-18980

Hemodynamic responses to pressure breathing during +Gz (PBG) in swine
p 160 N92-18982

Subjective reports concerning assisted positive pressure breathing under high sustained acceleration
p 170 N92-18983

Effects on Gz endurance/tolerance of reduced pressure schedules using the Advanced Technology Anti-G Suite (ATAGS)
p 171 N92-18987

Arizona State Univ., Flagstaff.

The influence of high, sustained acceleration stress on electromyographic activity of the trunk and leg muscles
p 170 N92-18980

Army Biomedical Research and Development Lab., Fort Detrick, MD.

Technology assessment and strategy for development of a rapid field water microbiology test kit
[AD-A243413] p 167 N92-18076

Army Research Inst. for the Behavioral and Social Sciences, Alexandria, VA.

Computer simulation model of cockpit crew coordination: A crew-level error model for the US Army's Blackhawk helicopter
[AD-A243618] p 178 N92-18009

B

Biodynamics International, Halifax (Nova Scotia).

Assessment of physiological requirements for protection of the human cardiovascular system against high sustained gravitational stresses
p 171 N92-18990

British Aerospace Aircraft Group, Kingston-upon-Thames (England).

The Military Aircrew Head Support System (MAHSS)
p 179 N92-18988

British Aerospace Public Ltd. Co., Bristol (England).

The effects upon visual performance of varying binocular overlap
p 182 N92-19016

C

California Univ., Berkeley.

Mechanisms of action of heavy metals and asbestos on cultured animal cells: Adaptation, transformation and progression
[DE92-004101] p 160 N92-18887

California Univ., San Diego, La Jolla.

The molecular basis for UV response of cultured human cells
[DE92-003766] p 167 N92-18296

Case Western Reserve Univ., Cleveland, OH.

Response devices and cognitive tasks
[AD-A243903] p 176 N92-19365

Center for Night Vision and Electro-Optics, Fort Belvoir, VA.

Design of helicopter night pilotage sensors: Lessons learned from recent flight experiments and field assessments
p 183 N92-19020

Comparison of second and third generation night vision goggles in time-limited scenarios
[AD-A244330] p 184 N92-19447

Central Inst. for the Deaf, Saint Louis, MO.

Binaural masking: An analysis of models
[AD-A244392] p 168 N92-18859

Centre d'Electronique de l'Armement, Bruz (France).

Biomechanical response of the head to G+ accelerations: Benefit for studies in combat simulators
p 182 N92-19014

Centre d'Etudes et de Recherches Bio-Physiologiques Appliquees a la Marine, Toulon (France).

Development of an electromyography and accelerometry ambulatory recording system
[CERB-91-07] p 184 N92-19926

Centre d'Etudes et de Recherches de Medecine

Aerospatiale, Bretigny sur Orge (France).
G-LOC. Gz and brain hypoxia. Gz/s and intracranial hypertension
p 170 N92-18984

Centre d'Etudes et de Recherches de Medecine Aerospatiale, Paris (France).

Does the future lie in binocular helmet display?
p 183 N92-19019

City Univ. of New York, NY.

Thermal responses during extended water immersion: Comparisons of rest and exercise, and levels of immersion
[AD-A244305] p 172 N92-19031

Corvallis Environmental Research Lab., OR.

Two different approaches for control and measurement of plant functions in closed environmental chambers
[PB92-108067] p 161 N92-19911

D

Defence and Civil Inst. of Environmental Medicine, North York (Ontario).

Maximum intra-thoracic pressure with PBG and AGSM
[DCIEM-91-43] p 169 N92-18979

Defence Research Establishment, Ottawa (Ontario).

Investigation of the effect of cooling the feet as a means of reducing thermal stress
[AD-A244264] p 172 N92-19333

Deutsche Forschungsanstalt fuer Luft- und Raumfahrt, Hamburg (Germany, F.R.).

The construction of personality questionnaires for selection of aviation personnel
[DLR-FB-91-18] p 176 N92-19410

Drexel Univ., Philadelphia, PA.

A cardiovascular model of G-stress effects: Preliminary studies with positive pressure breathing
p 171 N92-18989

E

Environmental Protection Agency, Research Triangle Park, NC.

Effects of 4 percent and 6 percent carboxyhemoglobin on arrhythmia production in patients with coronary artery disease
[PB91-243246] p 174 N92-19956

Executive Office of the President, Washington, DC.

Ionizing radiation risk assessment, BEIR 4
[DE92-004014] p 172 N92-19273

F

FWG Associates, Inc., Tullahoma, TN.

Chemical hazards database and detection system for Microgravity and Materials Processing Facility (MMPF)
[NASA-CR-184274] p 179 N92-18927

G

Galaxy Scientific Corp., Mays Landing, NJ.

Human factors in aviation maintenance, phase 1
[AD-A243844] p 184 N92-19808

H

Health Effects Research Lab., Research Triangle Park, NC.

Evaluating the human health effects of hazardous wastes: Reproduction and development, neurotoxicity, genetic toxicity, and cancer
[PB92-110352] p 173 N92-19702

Health Research, Inc., Albany, NY.

Activity-driven CNS changes in learning and development
[AD-A243790] p 175 N92-19064

I

IBIS Aerosystems Ltd., Sharnbrook (England).

Fixed wing night attack EO integration and sensor fusion
p 181 N92-19009

International Centre for Theoretical Physics, Trieste (Italy).

- On the transition period from chemical to biological evolution
[DE92-609049] p 159 N92-18132
- Global models for the biomechanics of green plants, part 2
[DE92-603590] p 160 N92-18757
- Global models for the biomechanics of green plants, part 3
[DE92-603591] p 160 N92-18758

J**Jet Propulsion Lab., California Inst. of Tech., Pasadena.**

- Supervisory telerobotics testbed for unstructured environments p 178 A92-26660

K**Krug Life Sciences, Inc., San Antonio, TX.**

- Prebreathing as a means to decrease the incidence of decompression sickness at altitude p 169 N92-18976

L**Laboratoire de Medecine Aerospatiale, Bretigny-sur-Orge (France).**

- Assisted positive pressure breathing: Effects on +Gz human tolerance in centrifuge p 170 N92-18985
- French equipment for integrated protection of combat aircraft crews: Principles and tests at high altitudes p 180 N92-18994
- Physiological protection equipment for combat aircraft: Integration of functions, principal technologies p 180 N92-18996
- Biomechanical response of the head to G+ accelerations: Benefit for studies in combat simulators p 182 N92-19014
- Restriction of the field of vision: Influence on eye-head coordination during orientation towards an eccentric target p 182 N92-19017
- Measurement of sight direction in a centrifuge. Part 2: Eye movement [REPT-1169/CEV/SE/LAMAS] p 172 N92-19255
- Measurement of sight direction in a centrifuge. Part 1: Head movement [REPT-1168/CEV/SE/LAMAS] p 173 N92-19347

M**Maryland Univ., Baltimore.**

- Regulation of brain muscarinic receptors by protein kinase C [AD-A244419] p 172 N92-19087

Mei Associates, Inc., San Antonio, TX.

- Characterization of Air Force training and computer-based training systems [AD-A243781] p 176 N92-19364

Messerschmitt-Boelkow-Blohm G.m.b.H., Munich (Germany, F.R.).

- Organizational aspects for preventing human faults in space systems: Systems engineering approaches to total quality management [MBB-UK-0139-91-PUB] p 179 N92-18481
- Helicopter integrated helmet requirements and test results p 181 N92-19011

Michigan Univ., Ann Arbor.

- Radiopharmaceuticals for diagnosis and treatment [DE92-004065] p 167 N92-18102
- Development of a revised mathematical model of the gastrointestinal tract [DE92-004748] p 168 N92-18598

Midwest Research Inst., Golden, CO.

- Effects of methanol vapor on human neurobehavioral measures [PB91-243253] p 174 N92-19957

Missouri Univ., Columbia.

- Effects of liquid desiccants on airborne microorganisms: Laboratory set up, procedure development, and preliminary measurements [DE92-004749] p 160 N92-19636

N**National Aeronautics and Space Administration, Washington, DC.**

- The effect of head-down tilt and water immersion on intracranial pressure in nonhuman primates p 158 A92-26332

Influences of chemical sympathectomy, demedullation, and hindlimb suspension on the V(O₂)max of rats p 158 A92-26334

Intermittent acceleration as a countermeasure to soleus muscle atrophy p 158 A92-26548

National Aeronautics and Space Administration. Ames Research Center, Moffett Field, CA.

The effect of head-down tilt and water immersion on intracranial pressure in nonhuman primates p 158 A92-26332

Influences of chemical sympathectomy, demedullation, and hindlimb suspension on the V(O₂)max of rats p 158 A92-26334

Intermittent acceleration as a countermeasure to soleus muscle atrophy p 158 A92-26548

Effects of a simulated microgravity model on cell structure and function in rat testis and epididymis p 158 A92-26549

Crew factors in flight operations. 8: Factors influencing sleep timing and subjective sleep quality in commercial long-haul flight crews [NASA-TM-103852] p 174 N92-19977

National Aeronautics and Space Administration.

Lyndon B. Johnson Space Center, Houston, TX.

Effects of a simulated microgravity model on cell structure and function in rat testis and epididymis p 158 A92-26549

A method of evaluating efficiency during space-suited work in a neutral buoyancy environment [NASA-TP-3153] p 184 N92-19772

National Aeronautics and Space Administration.

Marshall Space Flight Center, Huntsville, AL.

The solubility of the tetragonal form of hen egg white lysozyme from pH 4.0 to 5.4 p 157 A92-25429

National Inst. for Occupational Safety and Health,

Cincinnati, OH.

Development of a lung-cell model for studying workplace genotoxins [PB92-114644] p 174 N92-20020

Naval Postgraduate School, Monterey, CA.

A management proposal for determining the effects of combat stress on the man-machine interface of complex information display systems [AD-A243422] p 178 N92-18080

New Orleans Univ., LA.

A kinematic model for predicting the effects of helmet mounted systems p 182 N92-19015

New York Univ., New York.

Attention, imagery and memory: A neuromagnetic investigation [AD-A243859] p 175 N92-19069

Normalair-Garrett Ltd., Yeovil (England).

Advances in the design of military aircrew breathing systems with respect to high altitude and high acceleration conditions p 180 N92-18999

North Carolina Univ., Chapel Hill.

Automated protocol analysis: Tools and methodology [AD-A242040] p 175 N92-18245

Effects of 4 percent and 6 percent carboxyhemoglobin on arrhythmia production in patients with coronary artery disease [PB91-243246] p 174 N92-19956

O**Oakland Univ., Rochester, MI.**

Mechanisms for radiation damage in DNA [DE91-019080] p 167 N92-18025

Mechanisms for radiation damage in DNA [DE91-019079] p 168 N92-18419

Office National d'Etudes et de Recherches

Aerospatiales, Paris (France).

Circulatory biomechanics effects of accelerations p 171 N92-18991

Oxford Univ. (England).

Pulse oximetry: Theoretical and experimental models [OUEL-1885/91] p 168 N92-18339

P**Pennsylvania State Univ., University Park.**

Noninvasive determination of respiratory ozone absorption: Development of a fast-responding ozone analyzer [PB91-243220] p 173 N92-19952

Pennsylvania Univ., Philadelphia.

Multidimensional signal coding in the visual system [AD-A244281] p 179 N92-18816

Pathophysiology of spontaneous venous gas embolism [NASA-CR-189915] p 173 N92-19761

Effect of increased axial field of view on the performance of a volume PET scanner [DE92-004424] p 173 N92-19877

R**Rensselaer Polytechnic Inst., Troy, NY.**

Phylogenetic relationships among subsurface microorganisms [DE92-004421] p 159 N92-18113

Royal Air Force Inst. of Aviation Medicine,

Farnborough (England).

Pulmonary effects of high-G and positive pressure breathing p 169 N92-18978

The optimisation of a positive pressure breathing system for enhanced G protection p 171 N92-18986

Physiological requirements for partial pressure assemblies for altitude protection p 179 N92-18993

The experimental assessment of new partial pressure assemblies p 180 N92-18995

High altitude high acceleration and NBC warfare protective system for advanced fighter aircraft: Design considerations p 181 N92-19000

The RAF Institute of Aviation Medicine proposed helmet fitting/retention system p 181 N92-19013

Royal Aircraft Establishment, Farnborough (England).

The design and development of a full-cover partial pressure assembly for protection against high altitude and G p 180 N92-18998

The design and evaluation of fast-jet helmet mounted displays p 181 N92-19010

Helmet mounted displays: Human factors and fidelity p 183 N92-19021

Royal Netherlands Air Force, Soesterberg.

The Valsalva maneuver and its limited value in predicting +Gz-tolerance p 170 N92-18981

S**Sextant Avionique, Saint Medard en Jalles (France).**

Design methodology for a helmet display: Ergonomic aspects p 183 N92-19023

State Univ. of New York, Buffalo.

Retention modeling of diesel exhaust particles in rats and humans [PB91-243238] p 173 N92-19954

T**Toronto Univ. (Ontario).**

Bubble nucleation threshold in deoxygenated plasma p 160 N92-18974

Model of air flow in a multi-bladder physiological protection system p 180 N92-18997

U**University of Northeastern Illinois, Chicago.**

Individual difference effects in human-computer interaction [AD-A243172] p 179 N92-18516

University of Southern Illinois, Springfield.

The effects of exercise on pharmacokinetics and pharmacodynamics of physostigmine in rats [AD-A241867] p 159 N92-18257

V**Veterans Administration Hospital, White River**

Junction, VT.

PILOTS: User's guide [PB92-100262] p 173 N92-19689

Victoria Univ. (British Columbia).

Finite element modeling of sustained +Gz acceleration induced stresses in the human ventricle myocardium p 172 N92-18992

W**Wake Forest Univ., Winston-Salem, NC.**

Receptor subtype alterations: Bases of neuronal plasticity and learning [AD-A244406] p 176 N92-19799

Westinghouse Hanford Co., Richland, WA.

Beneficial uses of radiation [DE92-003024] p 168 N92-18799

Wisconsin Univ., Madison.

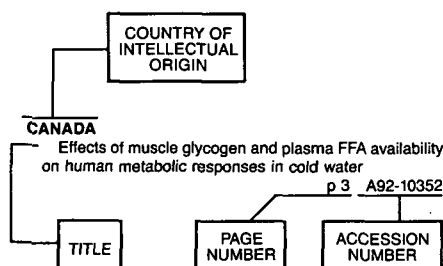
Behavior and learning in networks with differing amounts of structure [AD-A244080] p 176 N92-19083

FOREIGN TECHNOLOGY INDEX

AEROSPACE MEDICINE AND BIOLOGY / A Continuing Bibliography (Supplement 363)

June 1992

Typical Foreign Technology Index Listing



Listings in this index are arranged alphabetically by country of intellectual origin. The title of the document is used to provide a brief description of the subject matter. The page number and the accession number are included in each entry to assist the user in locating the citation in the abstract section. If applicable, a report number is also included as an aid in identifying the document.

A

AUSTRALIA

Aircrew tasks and cognitive complexity
[ARL-SYS-TM-150] p 178 N92-18051

B

BULGARIA

Protection from effects of radiation at sublethal doses during exposures to hypergravitation
p 156 A92-25276

C

CANADA

Temperature and humidity within the clothing microenvironment p 177 A92-26333

Bubble nucleation threshold in decomplemented plasma p 160 N92-18974

Maximum intra-thoracic pressure with PBG and AGSM [DCIEM-91-43] p 169 N92-18979

Assessment of physiological requirements for protection of the human cardiovascular system against high sustained gravitational stresses p 171 N92-18990

Finite element modeling of sustained +Gz acceleration induced stresses in the human ventricle myocardium p 172 N92-18992

Model of air flow in a multi-bladder physiological protection system p 180 N92-18997

Investigation of the effect of cooling the feet as a means of reducing thermal stress [AD-A244264] p 172 N92-19333

F

FRANCE

High Altitude and High Acceleration Protection for Military Aircrew
[AGARD-CP-516] p 168 N92-18972

G-LOC. Gz and brain hypoxia. Gz/s and intracranial hypertension p 170 N92-18984

Assisted positive pressure breathing: Effects on +Gz human tolerance in centrifuge p 170 N92-18985

Circulatory biomechanics effects of accelerations p 171 N92-18991

French equipment for integrated protection of combat aircraft crews: Principles and tests at high altitudes p 180 N92-18994

Physiological protection equipment for combat aircraft: Integration of functions, principal technologies p 180 N92-18996

Helmet Mounted Displays and Night Vision Goggles [AGARD-CP-517] p 181 N92-19008

Biomechanical response of the head to G+ accelerations: Benefit for studies in combat simulators p 182 N92-19014

Restriction of the field of vision: Influence on eye-head coordination during orientation towards an eccentric target p 182 N92-19017

Does the future lie in binocular helmet display? p 183 N92-19019

Design methodology for a helmet display: Ergonomic aspects p 183 N92-19023

Measurement of sight direction in a centrifuge. Part 2: Eye movement [REPT-1169/CEV/SE/LAMAS] p 172 N92-19255

Measurement of sight direction in a centrifuge. Part 1: Head movement [REPT-1168/CEV/SE/LAMAS] p 173 N92-19347

Development of an electromyography and accelerometry ambulatory recording system [CERB-91-07] p 184 N92-19926

Human performance assessment methods [AGARD-AG-308] p 176 N92-20037

G

GERMANY, FEDERAL REPUBLIC OF

Organizational aspects for preventing human faults in space systems: Systems engineering approaches to total quality management [MBB-UK-0139-91-PUB] p 179 N92-18481

Helicopter integrated helmet requirements and test results p 181 N92-19011

The construction of personality questionnaires for selection of aviation personnel [DLR-FB-91-18] p 176 N92-19410

H

HONG KONG

The effect of sleep deprivation and sustained military operations on near visual performance p 175 A92-26330

I

ITALY

On the transition period from chemical to biological evolution [DE92-609049] p 159 N92-18132

Global models for the biomechanics of green plants, part 2 [DE92-603590] p 160 N92-18757

Global models for the biomechanics of green plants, part 3 [DE92-603591] p 160 N92-18758

L

LATVIA

Characteristics of behavioral reactions of rats exposed to constant electric fields of different voltage p 157 A92-26024

N

NETHERLANDS

The Valsalva maneuver and its limited value in predicting +Gz-tolerance p 170 N92-18981

S

SWEDEN

G-endurance during heat stress and balanced pressure breathing p 165 A92-26331

U

U.S.S.R.

Physiological-hygienic aspects of increasing the heat resistance in humans (Review of the literature) p 161 A92-25251

Functional state of the cardiovascular system in fighter pilots with mitral valve prolapse p 161 A92-25252

Tolerance to chest-to-back (+Gx) and head-to-feet (+Gz) overloads during drug-induced hypohydration p 161 A92-25253

Responses of the regional vessel tonus to the effects of orthostatic and gravitational loads p 161 A92-25254

Some characteristics of humoral immunity and nonspecific resistance in pilots p 161 A92-25255

Glycemia as a risk factor of reduced tolerance to hypoxic hypoxia in flight personnel p 162 A92-25256

Changes in the erythrocyte membranes and of Na(+), K(+)-ATPase in participants of the Canadian-Soviet trans-Arctic ski trek p 162 A92-25257

Functional properties of blood proteins in highly trained athletes p 162 A92-25258

The effect of various types of abnormalities of the cupuloendolymphatic system of the vestibular apparatus on the system's dynamic characteristics p 155 A92-25259

Role of external respiration in the formation of the autonomic component of motion sickness p 162 A92-25260

The effect of weightlessness on the progress of muscle repair in rats flown on the Cosmos-2044 biosatellite p 155 A92-25261

The effect of weightlessness on healing of bone fractures in rats flown on the Cosmos-2044 biosatellite p 155 A92-25262

Variations in the prostaglandin content and in some parameters of lipid metabolism in humans under conditions of prolonged hypokinesia p 162 A92-25263

Emergency deposition of calcium by plasma and nonplasma buffer systems - The effect of long-term hypokinesia p 162 A92-25264

Some indices of protein and nucleic acid metabolism in the lymphoid organs of rats subjected to hypokinesia and to vitamin-B1 deficiency p 155 A92-25265

The information content of some hormonal indices and cyclic nucleotides in the estimation and prediction of resistance to the effect of acute hypoxia in operators p 163 A92-25266

Functional state of the CNS at an early period of the development of radiation sickness after irradiation with helium ions p 155 A92-25267

The effects of isolated and combined exposures to a constant magnetic field and antihypertensive hypokinesia on the central hemodynamics in rats p 156 A92-25268

An experimental study of the effect of high pressure on the adsorption properties of silochrome C-120 p 177 A92-25269

The effect of a pulsed electromagnetic field on the accumulation of calcium ions by the sarcoplasmic reticulum of rat heart muscle p 156 A92-25270

FOREIGN

Investigation of the cyclic kinetics of immunity by mathematical modeling methods p 156 A92-25271
 A method for determining levels of calcium in the hand using activated neutrons from (Pu-238)-Be sources p 177 A92-25273
 Night-sleep pattern and the susceptibility to motion sickness p 163 A92-25274
 Prophylactic and sensitizing effects of biologically active substances in the simulation of vestibulovegetative disorders p 156 A92-25275
 Hyperventilation (ISBN 5-02-005854-8) p 163 A92-25401
 Pileate mushrooms and algae - Objects for space biology p 156 A92-25402
 Use of air transport in delivering medical help to victims in the area of an earthquake epicenter p 163 A92-25956
 Biorhythmicity in decompression sickness p 163 A92-25957
 External respiration and gas exchange during space flights p 163 A92-26004
 Investigation of mental work capacity of cosmonauts aboard the Mir orbital complex p 175 A92-26005
 Hematologic indices in cosmonauts during a space flight p 163 A92-26006
 A model of the pilot's perception of the perturbed angular motion of the cockpit as part of the pilot's information model p 177 A92-26007
 Microbiological aspects of the environment of underwater habitats p 177 A92-26008
 External respiration and gas exchange in humans undergoing simulated diving at 350 m p 164 A92-26009
 The development of decompression regimens for excursion dives using data from prolonged exposures to 21 ata p 164 A92-26010
 Metabolic changes during hyperbaric oxygenation p 164 A92-26011
 The grooming and motor activities of rats under conditions of hyperbaria p 157 A92-26012
 Functional changes in the cardiovascular system and their pharmacological correction during immersion in a diving suit p 164 A92-26013
 Some characteristics of the motor function of digestive organs in humans with different susceptibilities to motion sickness p 164 A92-26014
 Nuclease activity of microorganisms and the problem of monitoring the state of autotrophic flora in operators in hermetically sealed environments p 164 A92-26015
 Biocatalysis using immobilized cells or enzymes as a method of water and air purification in a hermetically sealed habitat p 177 A92-26016
 The characteristics of prolactin secretion in response to different degrees of vestibular-analyzer lesions p 165 A92-26017
 Assessment of the health status and the characteristics of metabolism in cosmonauts during a prolonged space flight p 165 A92-26018
 A method for a comprehensive assessment of technical equipment for the medical compartment of a spacecraft p 177 A92-26019
 A mathematical approach to the assessment of the accuracy of physiological parameter measurements performed by different methods p 157 A92-26020
 Basic approaches to spacecraft studies of the biological effect of heavy ions of galactic cosmic rays p 157 A92-26021
 Analysis of the protein content in blood plasma of rats after their flight aboard the biosatellite Cosmos-1887, using two-dimensional electrophoresis p 157 A92-26022
 Studies of the biological activity of a nidus vespaee extract in animals subjected to physical loads p 157 A92-26023
 The role of specific and nonspecific afferent systems in the mechanism of changes in cortical evoked responses to vibration p 158 A92-26025
 Tyrosine hydroxylase activity in *Drosophila virilis* under normal conditions and heat stress p 158 A92-27494
 Estimating the organism's nonspecific resistance from individual reaction to hypoxic testing p 166 A92-27498
 The effect of the metabolic preparation Rikavit on the process of human adaptation to high altitudes p 166 A92-27499
 Dynamics of competing interaction between verbal and manual activities during adaptation and readaptation after transmeridional flight p 166 A92-27500
 Analysis of the stages of the night sleep of human subjects from the standpoint of the functional quantization of the vital activity p 166 A92-27504
 Dynamics of kidney tissue and vessel changes in white rats due to acute cold stress p 158 A92-27600
 The primary-reaction syndrome caused by a radiation exposure (Review of the literature) p 166 A92-27629

The characteristics of physiological reactions of an organism during the generation of muscular effort needed to operate control pedals p 166 A92-27630
 The characteristics of structural changes in membranes of the rectum of animals in the process of adaptation to high altitude p 159 A92-27635
 Psychophysiological training of multiseat-aircraft flight personnel for coordinating activities during emergency situations p 167 A92-27642
 Content and composition of free fatty acids in the sarcoplasmic reticulum membranes after exposure to ionizing radiation p 159 A92-28370
 Ultrastructural organization of chlorella cells cultivated on a solid medium in microgravity p 159 A92-28384

UNITED KINGDOM

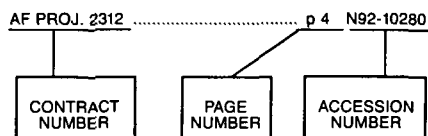
Phasic skin conductance activity and motion sickness p 165 A92-26329
 Arm of the future p 178 A92-27373
 Pulse oximetry: Theoretical and experimental models (OUEL-1885/91) p 168 A92-18339
 Pulmonary effects of high-G and positive pressure breathing p 169 A92-18978
 The optimisation of a positive pressure breathing system for enhanced G protection p 171 A92-18986
 The Military Aircrew Head Support System (MAHSS) p 179 A92-18988
 Physiological requirements for partial pressure assemblies for altitude protection p 179 A92-18993
 The experimental assessment of new partial pressure assemblies p 180 A92-18995
 The design and development of a full-cover partial pressure assembly for protection against high altitude and G p 180 A92-18998
 Advances in the design of military aircrew breathing systems with respect to high altitude and high acceleration conditions p 180 A92-18999
 High altitude high acceleration and NBC warfare protective system for advanced fighter aircraft: Design considerations p 181 A92-19000
 Fixed wing night attack EO integration and sensor fusion p 181 A92-19009
 The design and evaluation of fast-jet helmet mounted displays p 181 A92-19010
 The RAF Institute of Aviation Medicine proposed helmet fitting/retention system p 181 A92-19013
 The effects upon visual performance of varying binocular overlap p 182 A92-19016
 Helmet mounted displays: Human factors and fidelity p 183 A92-19021

CONTRACT NUMBER INDEX

AEROSPACE MEDICINE AND BIOLOGY / A Continuing Bibliography (Supplement 363)

June 1992

Typical Contract Number Index Listing



Listings in this index are arranged alphanumerically by contract number. Under each contract number, the accession numbers denoting documents that have been produced as a result of research done under the contract are shown. The accession number denotes the number by which the citation is identified in the abstract section. Preceding the accession number is the page number on which the citation may be found.

AF PROJ. 2305	p 176	N92-19083
AF PROJ. 2312	p 175	N92-19064
	p 176	N92-19799
AF PROJ. 2313	p 179	N92-18816
	p 168	N92-18859
	p 176	N92-19365
AF PROJ. 2868	p 184	N92-19829
AF PROJ. 7231	p 184	N92-19829
AF-AFOSR-0082-91	p 179	N92-18816
AF-AFOSR-0084-90	p 176	N92-19365
AF-AFOSR-0178-89	p 176	N92-19083
AF-AFOSR-0238-90	p 175	N92-19064
AF-AFOSR-0302-89	p 168	N92-18859
AF-AFOSR-0372-90	p 176	N92-19799
DA PROJ. 3E1-62787-A-879	p 172	N92-19031
DAAL03-88-K-0078	p 172	N92-19087
DAMA17-88-C-8024	p 159	N92-18257
DAMD17-88-C-8013	p 172	N92-19031
DE-AC05-76OR-00033	p 168	N92-18598
	p 172	N92-19273
	p 160	N92-19636
DE-AC06-87RL-10930	p 168	N92-18799
DE-AS03-79EV-10277	p 160	N92-18887
DE-FG02-86ER-60455	p 167	N92-18025
	p 168	N92-18419
DE-FG02-88ER-60639	p 167	N92-18102
DE-FG02-88ER-60642	p 173	N92-19877
DE-FG02-90ER-60989	p 159	N92-18113
DE-FG03-86ER-60429	p 167	N92-18296
DRET-88-1035	p 172	N92-19255
	p 173	N92-19347
DRET-91-1012-J	p 184	N92-19926
F33615-88-C-0003	p 176	N92-19364
F49620-87-C-0078	p 178	A92-28150
F49620-88-K-0004	p 175	N92-19069
MDA903-82-C-0157	p 179	N92-18516
NAGW-70	p 158	A92-26548
NAG2-239	p 158	A92-26548
NAG2-392	p 158	A92-26334
NAG9-154	p 173	N92-19761
NAS8-37746	p 179	N92-18927
NAS9-17416	p 158	A92-26549
NCC2-127	p 158	A92-26332
NCC2-370	p 158	A92-26549
NGT-50493	p 158	A92-26334
NSF IRI-85-19517	p 175	N92-18245
NSF IRI-88-17305	p 175	N92-18245
N00014-86-K-0680	p 175	N92-18245
505-64-53	p 174	N92-19977

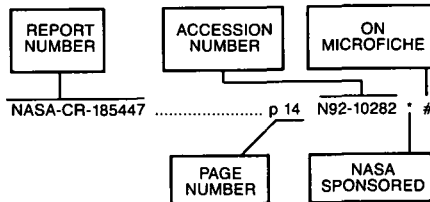
CONTRACT

REPORT NUMBER INDEX

AEROSPACE MEDICINE AND BIOLOGY / A Continuing Bibliography (Supplement 363)

June 1992

Typical Report Number Index Listing



Listings in this index are arranged alphanumerically by report number. The page number indicates the page on which the citation is located. The accession number denotes the number by which the citation is identified. An asterisk (*) indicates that the item is a NASA report. A pound sign (#) indicates that the item is available on microfiche.

A-91106 p 174 N92-19977 * #

AD-A241867 p 159 N92-18257 #

AD-A242040 p 175 N92-18245 #

AD-A243172 p 179 N92-18516 #

AD-A243413 p 167 N92-18076 #

AD-A243422 p 178 N92-18080 #

AD-A243618 p 178 N92-18009 #

AD-A243781 p 176 N92-19364 #

AD-A243790 p 175 N92-19064 #

AD-A243844 p 184 N92-19808 #

AD-A243857 p 184 N92-19829 #

AD-A243859 p 175 N92-19069 #

AD-A243903 p 176 N92-19365 #

AD-A244045 p 184 N92-19179 #

AD-A244080 p 176 N92-19083 #

AD-A244264 p 172 N92-19333 #

AD-A244281 p 179 N92-18816 #

AD-A244305 p 172 N92-19031 #

AD-A244330 p 184 N92-19447 #

AD-A244392 p 168 N92-18859 #

AD-A244406 p 176 N92-19799 #

AD-A244419 p 172 N92-19087 #

AFIT/GAE/ENY/91D-22 p 184 N92-19179 #

AFOSR-91-0937TR p 175 N92-19064 #

AFOSR-91-0939TR p 176 N92-19083 #

AFOSR-91-0970TR p 175 N92-19069 #

AFOSR-91-0984TR p 176 N92-19365 #

AFOSR-91-1013TR p 179 N92-18816 #

AFOSR-91-1022TR p 168 N92-18859 #

AFOSR-91-1028TR p 176 N92-19799 #

AGARD-AG-308 p 176 N92-20037 #

AGARD-CP-516 p 168 N92-18972 #

AGARD-CP-517 p 181 N92-19008 #

AL-TP-1991-0048 p 176 N92-19364 #

AL-TR-1991-0096 p 184 N92-19829 #

AMSEL-NV-TR-0080 p 184 N92-19447 #

AR-006-650 p 178 N92-18051 #

ARI-RN-92-05 p 179 N92-18516 #

ARI-RR-1601 p 178 N92-18009 #

ARL-SYS-TM-150 p 178 N92-18051 #

ARO-25468.1-LS p 172 N92-19087 #

CERB-91-07 p 184 N92-19926 #

CIRRPC-8 p 172 N92-19273 #

CONF-911106-34 p 173 N92-19877 #

DCIEM-91-43 p 169 N92-18979 #

DE91-019079 p 168 N92-18419 #

DE91-019080 p 167 N92-18025 #

DE92-003024 p 168 N92-18799 #

DE92-003766 p 167 N92-18296 #

DE92-004014 p 172 N92-19273 #

DE92-004065 p 167 N92-18102 #

DE92-004101 p 160 N92-18887 #

DE92-004421 p 159 N92-18113 #

DE92-004424 p 173 N92-19877 #

DE92-004748 p 168 N92-18598 #

DE92-004749 p 160 N92-19636 #

DE92-603590 p 160 N92-18757 #

DE92-603591 p 160 N92-18758 #

DE92-609049 p 159 N92-18132 #

DLR-FB-91-18 p 176 N92-19410 #

DOE/ER-60429/T1 p 167 N92-18296 #

DOE/ER-60455/5 p 168 N92-18419 #

DOE/ER-60455/6 p 167 N92-18025 #

DOE/ER-60639/4 p 167 N92-18102 #

DOE/ER-60989/2 p 159 N92-18113 #

DOE/EV-10277/T2 p 160 N92-18887 #

DOE/OR-00033/T453 p 168 N92-18598 #

DOE/OR-00033/T454 p 160 N92-19636 #

DOT/FAA/AM-91/16 p 184 N92-19808 #

DREO-TN-91-15 p 172 N92-19333 #

EPA/600/D-91/231 p 161 N92-19911 #

EPA/600/D-91/236 p 173 N92-19702 #

ETN-92-90600 p 179 N92-18481 #

ETN-92-90735 p 176 N92-19410 #

ETN-92-90864 p 172 N92-19255 #

ETN-92-90865 p 173 N92-19347 #

ETN-92-90909 p 168 N92-18339 #

ETN-92-91083 p 184 N92-19926 #

HEI/RR-91/39 p 173 N92-19952 #

HEI/RR-91/40 p 173 N92-19954 #

HEI/RR-91/41 p 174 N92-19956 #

HEI/RR-91/42 p 174 N92-19957 #

IC-90/474-PT-2 p 160 N92-18757 #

IC-90/475-PT-3 p 160 N92-18758 #

IC-91/127 p 159 N92-18132 #

ISBN 0-8121-1248-2 p 165 A92-26700

ISBN 5-02-005854-8 p 163 A92-25401

ISBN-92-835-0510-7 p 176 N92-20037 #

ISBN-92-835-0638-3 p 168 N92-18972 #

ISBN-92-835-0645-6 p 181 N92-19008 #

ISSN-0939-2963 p 176 N92-19410 #

MBB-UK-0139-91-PUB p 179 N92-18481 #

NAS 1.15:103852 p 174 N92-19977 * #

NAS 1.26:184274 p 179 N92-18927 * #

NAS 1.26:189915 p 173 N92-19761 * #

NAS 1.60:3153 p 184 N92-19772 * #

NASA-CR-184274 p 179 N92-18927 * #

NASA-CR-189915 p 173 N92-19761 * #

NASA-TM-103852 p 174 N92-19977 * #

NASA-TP-3153 p 184 N92-19772 * #

ORAU-91/J-20 p 172 N92-19273 #

OUEL-1885/91 p 168 N92-18339 #

PB91-243220 p 173 N92-19952 #

PB91-243238 p 173 N92-19954 #

PB91-243246 p 174 N92-19956 #

PB91-243253 p 174 N92-19957 #

PB92-100262 p 173 N92-19689 #

PB92-108067 p 161 N92-19911 #

PB92-110352 p 173 N92-19702 #

PB92-114644 p 174 N92-20020 #

REPT-1168/CEV/SE/LAMAS p 173 N92-19347 #

REPT-1169/CEV/SE/LAMAS p 172 N92-19255 #

S-648 p 184 N92-19772 * #

TR91-034 p 175 N92-18245 #

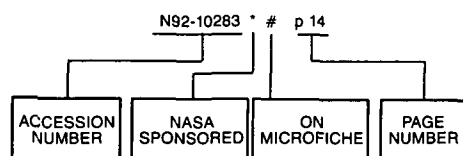
USABRDL-TR-9106 p 167 N92-18076 #

UW-144-AS50 p 176 N92-19083 #

WHC-SA-1273 p 168 N92-18799 #

ACCESSION NUMBER INDEX

Typical Accession Number Index Listing



Listings in this index are arranged alphanumerically by accession number. The page number listed to the right indicates the page on which the citation is located. An asterisk (*) indicates that the item is a NASA report. A pound sign (#) indicates that the item is available on microfiche.

A92-25251	p 161	A92-26332	p 158
A92-25252	p 161	A92-26333	p 177
A92-25253	p 161	A92-26334	p 158
A92-25254	p 161	A92-26335	p 165
A92-25255	p 161	A92-26336	p 165
A92-25256	p 162	A92-26548	p 158
A92-25257	p 162	A92-26549	p 158
A92-25258	p 162	A92-26660 *	p 178
A92-25259	p 155	A92-26700	p 165
A92-25260	p 162	A92-27373	p 178
A92-25261	p 155	A92-27494	p 158
A92-25262	p 155	A92-27498	p 166
A92-25263	p 162	A92-27499	p 166
A92-25264	p 162	A92-27500	p 166
A92-25265	p 155	A92-27504	p 166
A92-25266	p 163	A92-27600	p 158
A92-25267	p 155	A92-27629	p 166
A92-25268	p 156	A92-27630	p 166
A92-25269	p 177	A92-27635	p 159
A92-25270	p 156	A92-27642	p 167
A92-25271	p 156	A92-28150	p 178
A92-25273	p 177	A92-28236	p 159
A92-25274	p 163	A92-28370	p 159
A92-25275	p 156	A92-28384	p 159
A92-25276	p 156		
A92-25401	p 163	N92-18009 #	p 178
A92-25402	p 156	N92-18025 #	p 167
A92-25429 *	p 157	N92-18051 #	p 178
A92-25956	p 163	N92-18076 #	p 167
A92-25957	p 163	N92-18080 #	p 178
A92-26004	p 163	N92-18102 #	p 167
A92-26005	p 175	N92-18113 #	p 159
A92-26006	p 163	N92-18132 #	p 159
A92-26007	p 177	N92-18245 #	p 175
A92-26008	p 177	N92-18257 #	p 159
A92-26009	p 164	N92-18296 #	p 167
A92-26010	p 164	N92-18339 #	p 168
A92-26011	p 164	N92-18419 #	p 168
A92-26012	p 157	N92-18481 #	p 179
A92-26013	p 164	N92-18516 #	p 179
A92-26014	p 164	N92-18598 #	p 168
A92-26015	p 164	N92-18757 #	p 160
A92-26016	p 177	N92-18758 #	p 160
A92-26017	p 165	N92-18799 #	p 168
A92-26018	p 165	N92-18816 #	p 179
A92-26019	p 177	N92-18859 #	p 168
A92-26020	p 157	N92-18887 #	p 160
A92-26021	p 157	N92-18927 *	p 179
A92-26022	p 157	N92-18972 #	p 168
A92-26023	p 157	N92-18973 #	p 169
A92-26024	p 157	N92-18974 #	p 160
A92-26025	p 158	N92-18975 #	p 169
A92-26329	p 165	N92-18976 #	p 169
A92-26330	p 175	N92-18977 #	p 169
A92-26331	p 165	N92-18978 #	p 169

N92-18979 #	p 169
N92-18980 #	p 170
N92-18981 #	p 170
N92-18982 #	p 160
N92-18983 #	p 170
N92-18984 #	p 170
N92-18985 #	p 170
N92-18986 #	p 171
N92-18987 #	p 171
N92-18988 #	p 179
N92-18989 #	p 171
N92-18990 #	p 171
N92-18991 #	p 171
N92-18992 #	p 172
N92-18993 #	p 179
N92-18994 #	p 180
N92-18995 #	p 180
N92-18996 #	p 180
N92-18997 #	p 180
N92-18998 #	p 180
N92-18999 #	p 180
N92-19000 #	p 181
N92-19008 #	p 181
N92-19009 #	p 181
N92-19010 #	p 181
N92-19011 #	p 181
N92-19012 #	p 181
N92-19013 #	p 181
N92-19014 #	p 182
N92-19015 #	p 182
N92-19016 #	p 182
N92-19017 #	p 182
N92-19018 #	p 182
N92-19019 #	p 183
N92-19020 #	p 183
N92-19021 #	p 183
N92-19022 #	p 183
N92-19023 #	p 183
N92-19031 #	p 172
N92-19064 #	p 175
N92-19069 #	p 175
N92-19083 #	p 176
N92-19087 #	p 172
N92-19179 #	p 184
N92-19255 #	p 172
N92-19273 #	p 172
N92-19333 #	p 172
N92-19347 #	p 173
N92-19364 #	p 176
N92-19365 #	p 176
N92-19410 #	p 176
N92-19447 #	p 184
N92-19636 #	p 160
N92-19689 #	p 173
N92-19702 #	p 173
N92-19761 *	p 173
N92-19772 *	p 184
N92-19799 #	p 176
N92-19808 #	p 184
N92-19829 #	p 184
N92-19877 #	p 173
N92-19911 #	p 161
N92-19926 #	p 184
N92-19952 #	p 173
N92-19954 #	p 173
N92-19956 #	p 174
N92-19957 #	p 174
N92-19977 *	p 174
N92-20020 #	p 174
N92-20037 #	p 176

AVAILABILITY OF CITED PUBLICATIONS

IAA ENTRIES (A92-10000 Series)

Publications announced in *IAA* are available from the AIAA Technical Information Service as follows: Paper copies of accessions are available at \$10.00 per document (up to 50 pages), additional pages \$0.25 each. Standing order microfiche are available at the rate of \$1.45 per microfiche for *IAA* source documents and \$1.75 per microfiche for AIAA meeting papers.

Minimum air-mail postage to foreign countries is \$2.50. All foreign orders are shipped on payment of pro-forma invoices.

All inquiries and requests should be addressed to: Technical Information Service, American Institute of Aeronautics and Astronautics, 555 West 57th Street, New York, NY 10019. Please refer to the accession number when requesting publications.

STAR ENTRIES (N92-10000 Series)

One or more sources from which a document announced in *STAR* is available to the public is ordinarily given on the last line of the citation. The most commonly indicated sources and their acronyms or abbreviations are listed below. If the publication is available from a source other than those listed, the publisher and his address will be displayed on the availability line or in combination with the corporate source line.

Avail: NTIS. Sold by the National Technical Information Service. Prices for hard copy (HC) and microfiche (MF) are indicated by a price code preceded by the letters HC or MF in the *STAR* citation. Current values for the price codes are given in the tables on NTIS PRICE SCHEDULES.

Documents on microfiche are designated by a pound sign (#) following the accession number. The pound sign is used without regard to the source or quality of the microfiche.

Initially distributed microfiche under the NTIS SRIM (Selected Research in Microfiche) is available at greatly reduced unit prices. For this service and for information concerning subscription to NASA printed reports, consult the NTIS Subscription Section, Springfield, VA 22161.

NOTE ON ORDERING DOCUMENTS: When ordering NASA publications (those followed by the * symbol), use the N accession number. NASA patent applications (only the specifications are offered) should be ordered by the US-Patent-Appl-SN number. Non-NASA publications (no asterisk) should be ordered by the AD, PB, or other *report number* shown on the last line of the citation, not by the N accession number. It is also advisable to cite the title and other bibliographic identification.

Avail: SOD (or GPO). Sold by the Superintendent of Documents, U.S. Government Printing Office, in hard copy. The current price and order number are given following the availability line. (NTIS will fill microfiche requests, as indicated above, for those documents identified by a # symbol.)

- Avail: BLL (formerly NLL): British Library Lending Division, Boston Spa, Wetherby, Yorkshire, England. Photocopies available from this organization at the price shown. (If none is given, inquiry should be addressed to the BLL.)
- Avail: DOE Depository Libraries. Organizations in U.S. cities and abroad that maintain collections of Department of Energy reports, usually in microfiche form, are listed in *Energy Research Abstracts*. Services available from the DOE and its depositories are described in a booklet, *DOE Technical Information Center - Its Functions and Services* (TID-4660), which may be obtained without charge from the DOE Technical Information Center.
- Avail: ESDU. Pricing information on specific data, computer programs, and details on Engineering Sciences Data Unit (ESDU) topic categories can be obtained from ESDU International Ltd. Requesters in North America should use the Virginia address while all other requesters should use the London address, both of which are on the page titled ADDRESSES OF ORGANIZATIONS.
- Avail: Fachinformationszentrum, Karlsruhe. Sold by the Fachinformationszentrum Energie, Physik, Mathematik GMBH, Eggenstein Leopoldshafen, Federal Republic of Germany, at the price shown in deutschmarks (DM).
- Avail: HMSO. Publications of Her Majesty's Stationery Office are sold in the U.S. by Pendragon House, Inc. (PHI), Redwood City, CA. The U.S. price (including a service and mailing charge) is given, or a conversion table may be obtained from PHI.
- Avail: NASA Public Document Rooms. Documents so indicated may be examined at or purchased from the National Aeronautics and Space Administration, Public Documents Room (Room 126), 600 Independence Ave., S.W., Washington, DC 20546, or public document rooms located at each of the NASA research centers, the NASA Space Technology Laboratories, and the NASA Pasadena Office at the Jet Propulsion Laboratory.
- Avail: Univ. Microfilms. Documents so indicated are dissertations selected from *Dissertation Abstracts* and are sold by University Microfilms as xerographic copy (HC) and microfilm. All requests should cite the author and the Order Number as they appear in the citation.
- Avail: US Patent and Trademark Office. Sold by Commissioner of Patents and Trademarks, U.S. Patent and Trademark Office, at the standard price of \$1.50 each, postage free.
- Avail: (US Sales Only). These foreign documents are available to users within the United States from the National Technical Information Service (NTIS). They are available to users outside the United States through the International Nuclear Information Service (INIS) representative in their country, or by applying directly to the issuing organization.
- Avail: USGS. Originals of many reports from the U.S. Geological Survey, which may contain color illustrations, or otherwise may not have the quality of illustrations preserved in the microfiche or facsimile reproduction, may be examined by the public at the libraries of the USGS field offices whose addresses are listed in this Introduction. The libraries may be queried concerning the availability of specific documents and the possible utilization of local copying services, such as color reproduction.
- Avail: Issuing Activity, or Corporate Author, or no indication of availability. Inquiries as to the availability of these documents should be addressed to the organization shown in the citation as the corporate author of the document.

FEDERAL DEPOSITORY LIBRARY PROGRAM

In order to provide the general public with greater access to U.S. Government publications, Congress established the Federal Depository Library Program under the Government Printing Office (GPO), with 53 regional depositories responsible for permanent retention of material, inter-library loan, and reference services. At least one copy of nearly every NASA and NASA-sponsored publication, either in printed or microfiche format, is received and retained by the 53 regional depositories. A list of the regional GPO libraries, arranged alphabetically by state, appears on the inside back cover. These libraries are *not* sales outlets. A local library can contact a Regional Depository to help locate specific reports, or direct contact may be made by an individual.

PUBLIC COLLECTION OF NASA DOCUMENTS

An extensive collection of NASA and NASA-sponsored publications is maintained by the British Library Lending Division, Boston Spa, Wetherby, Yorkshire, England for public access. The British Library Lending Division also has available many of the non-NASA publications cited in *STAR*. European requesters may purchase facsimile copy or microfiche of NASA and NASA-sponsored documents, those identified by both the symbols # and * from ESA – Information Retrieval Service European Space Agency, 8-10 rue Mario-Nikis, 75738 CEDEX 15, France.

STANDING ORDER SUBSCRIPTIONS

NASA SP-7011 supplements and annual index are available from the National Technical Information Service (NTIS) on standing order subscription as PB92-912300, at price code A03. Current values for the price codes are listed on page APP-5. Standing order subscriptions do not terminate at the end of a year, as do regular subscriptions, but continue indefinitely unless specifically terminated by the subscriber. Questions on the availability of the predecessor publications, *Aerospace Medicine and Biology* (Volumes I-XI), should be directed to NTIS.

ADDRESSES OF ORGANIZATIONS

American Institute of Aeronautics and Astronautics
Technical Information Service
555 West 57th Street, 12th Floor
New York, New York 10019

British Library Lending Division,
Boston Spa, Wetherby, Yorkshire,
England

Commissioner of Patents and Trademarks
U.S. Patent and Trademark Office
Washington, DC 20231

Department of Energy
Technical Information Center
P.O. Box 62
Oak Ridge, Tennessee 37830

European Space Agency-Information Retrieval Service
ESRIN
Via Galileo Galilei
00044 Frascati (Rome) Italy

Engineering Sciences Data Unit International
P.O. Box 1633
Manassas, Virginia 22110

Engineering Sciences Data Unit International, Ltd.
251-259 Regent Street
London, W1R 7AD, England

Fachinformationszentrum Energie, Physik, Mathematik
GMBH
7514 Eggenstein Leopoldshafen
Federal Republic of Germany

Her Majesty's Stationery Office
P.O. Box 569, S.E. 1
London, England

NASA Center for AeroSpace Information
P.O. Box 8757
Baltimore, MD 21240-0757

National Aeronautics and Space Administration
Scientific and Technical Information Program (JTT)
Washington, DC 20546

National Technical Information Service
5285 Port Royal Road
Springfield, Virginia 22161

Pendragon House, Inc.
899 Broadway Avenue
Redwood City, California 94063

Superintendent of Documents
U.S. Government Printing Office
Washington, DC 20402

University Microfilms
A Xerox Company
300 North Zeeb Road
Ann Arbor, Michigan 48106

University Microfilms, Ltd.
Tylers Green
London, England

U.S. Geological Survey Library National Center
MS 950
12201 Sunrise Valley Drive
Reston, Virginia 22092

U.S. Geological Survey Library
2255 North Gemini Drive
Flagstaff, Arizona 86001

U.S. Geological Survey
345 Middlefield Road
Menlo Park, California 94025

U.S. Geological Survey Library
Box 25046
Denver Federal Center, MS914
Denver, Colorado 80225

NTIS PRICE SCHEDULES

(Effective October 1, 1991)

Schedule A STANDARD PRICE DOCUMENTS AND MICROFICHE**

PRICE CODE	NORTH AMERICAN PRICE	FOREIGN PRICE
A01	\$ 9.00	\$ 18.00
A02	12.50	25.00
A03	17.00	34.00
A04-A05	19.00	38.00
A06-A09	26.00	52.00
A10-A13	35.00	70.00
A14-A17	43.00	86.00
A18-A21	50.00	100.00
A22-A25	59.00	118.00
A99	*	*
N01	60.00	120.00
N02	59.00	118.00
N03	20.00	40.00

Schedule E EXCEPTION PRICE DOCUMENTS AND MICROFICHE**

PRICE CODE	NORTH AMERICAN PRICE	FOREIGN PRICE
E01	\$11.00	\$ 22.00
E02	14.00	28.00
E03	16.00	32.00
E04	19.00	38.00
E05	21.00	42.00
E06	24.00	48.00
E07	27.00	54.00
E08	30.00	60.00
E09	33.00	66.00
E10	36.00	72.00
E11	39.00	78.00
E12	43.00	86.00
E13	46.00	92.00
E14	50.00	100.00
E15	54.00	108.00
E16	59.00	118.00
E17	64.00	128.00
E18	69.00	138.00
E19	76.00	152.00
E20	88.00	176.00
E99	*	*

* Contact NTIS for price quote.

** Effective January 1, 1991, the microfiche copy of any new document entering the NTIS collection will be priced the same as the paper copy of the document.

IMPORTANT NOTICE

NTIS Shipping and Handling Charges

U.S., Canada, Mexico — ADD \$3.00 per TOTAL ORDER

All Other Countries — ADD \$4.00 per TOTAL ORDER

Exceptions — Does NOT apply to:

ORDERS REQUESTING NTIS RUSH HANDLING
ORDERS FOR SUBSCRIPTION OR STANDING ORDER PRODUCTS ONLY

NOTE: Each additional delivery address on an order
requires a separate shipping and handling charge.

1. Report No. NASA SP-7011(363)		2. Government Accession No.		3. Recipient's Catalog No.	
4. Title and Subtitle Aerospace Medicine and Biology A Continuing Bibliography (Supplement 363)				5. Report Date June 1992	
				6. Performing Organization Code JTT	
7. Author(s)				8. Performing Organization Report No.	
				10. Work Unit No.	
9. Performing Organization Name and Address NASA Scientific and Technical Information Program				11. Contract or Grant No.	
				13. Type of Report and Period Covered Special Publication	
12. Sponsoring Agency Name and Address National Aeronautics and Space Administration Washington, DC 20546				14. Sponsoring Agency Code	
15. Supplementary Notes					
16. Abstract This bibliography lists 179 reports, articles and other documents introduced into the NASA scientific and technical information system in May 1992.					
17. Key Words (Suggested by Author(s)) Aerospace Medicine Bibliographies Biological Effects			18. Distribution Statement Unclassified - Unlimited Subject Category - 52		
19. Security Classif. (of this report) Unclassified		20. Security Classif. (of this page) Unclassified		21. No. of Pages 74	
				22. Price * A04/HC	

*For sale by the National Technical Information Service, Springfield, Virginia 22161

FEDERAL REGIONAL DEPOSITORY LIBRARIES

ALABAMA

AUBURN UNIV. AT MONTGOMERY LIBRARY
Documents Dept.
7300 University Drive
Montgomery, AL 36117-3596
(205) 244-3650 FAX: (205) 244-0678

UNIV. OF ALABAMA

Amelia Gayle Gorgas Library
Govt. Documents
Box 870266
Tuscaloosa, AL 35487-0266
(205) 348-6046 FAX: (205) 348-8833

ARIZONA

DEPT. OF LIBRARY, ARCHIVES, AND PUBLIC RECORDS

Federal Documents
Third Floor State Capitol
1700 West Washington
Phoenix, AZ 85007
(602) 542-4121 FAX: (602) 542-4400;
542-4500

ARKANSAS

ARKANSAS STATE LIBRARY

State Library Services
One Capitol Mall
Little Rock, AR 72201
(501) 682-2869

CALIFORNIA

CALIFORNIA STATE LIBRARY

Govt. Publications Section
914 Capitol Mall - P.O. Box 942837
Sacramento, CA 94237-0001
(916) 322-4572 FAX: (916) 324-8120

COLORADO

UNIV. OF COLORADO - BOULDER

Norlin Library
Govt. Publications
Campus Box 184
Boulder, CO 80309-0184
(303) 492-8834 FAX: (303) 492-2185

DENVER PUBLIC LIBRARY

Govt. Publications Dept. BS/GPD
1357 Broadway
Denver, CO 80203
(303) 571-2135

CONNECTICUT

CONNECTICUT STATE LIBRARY

231 Capitol Avenue
Hartford, CT 06106
(203) 566-4971 FAX: (203) 566-3322

FLORIDA

UNIV. OF FLORIDA LIBRARIES

Documents Dept.
Library West
Gainesville, FL 32611-2048
(904) 392-0366 FAX: (904) 392-7251

GEORGIA

UNIV. OF GEORGIA LIBRARIES

Govt. Documents Dept.
Jackson Street
Athens, GA 30602
(404) 542-8949 FAX: (404) 542-6522

HAWAII

UNIV. OF HAWAII

Hamilton Library
Govt. Documents Collection
2550 The Mall
Honolulu, HI 96822
(808) 948-8230 FAX: (808) 956-5968

IDAHO

UNIV. OF IDAHO LIBRARY

Documents Section
Moscow, ID 83843
(208) 885-6344 FAX: (208) 885-6817

ILLINOIS

ILLINOIS STATE LIBRARY

Reference Dept.
300 South Second
Springfield, IL 62701-1796
(217) 782-7596 FAX: (217) 524-0041

INDIANA

INDIANA STATE LIBRARY

Serials/Documents Section
140 North Senate Avenue
Indianapolis, IN 46204
(317) 232-3678 FAX: (317) 232-3728

IOWA

UNIV. OF IOWA LIBRARIES

Govt. Publications Dept.
Washington & Madison Streets
Iowa City, IA 52242
(319) 335-5926 FAX: (319) 335-5830

KANSAS

UNIV. OF KANSAS

Govt. Documents & Map Library
6001 Malatt Hall
Lawrence, KS 66045-2800
(913) 864-4660 FAX: (913) 864-5380

KENTUCKY

UNIV. OF KENTUCKY LIBRARIES

Govt. Publications/Maps Dept.
Lexington, KY 40506-0039
(606) 257-3139 FAX: (606) 257-1563;
257-8379

LOUISIANA

LOUISIANA STATE UNIV.

Middleton Library
Govt. Documents Dept.
Baton Rouge, LA 70803
(504) 388-2570 FAX: (504) 388-6992

LOUISIANA TECHNICAL UNIV.

Prescott Memorial Library
Govt. Documents Dept.
305 Wisteria Street
Ruston, LA 71270-9985
(318) 257-4962 FAX: (318) 257-2447

MAINE

TRI-STATE DOCUMENTS DEPOSITORY

Raymond H. Fogler Library
Govt. Documents & Microforms Dept.
Univ. of Maine
Orono, ME 04469
(207) 581-1680

MARYLAND

UNIV. OF MARYLAND

Hornbake Library
Govt. Documents/Maps Unit
College Park, MD 20742
(301) 454-3034 FAX: (301) 454-4985

MASSACHUSETTS

BOSTON PUBLIC LIBRARY

Govt. Documents Dept.
666 Boylston Street
Boston, MA 02117
(617) 536-5400 ext. 226
FAX: (617) 267-8273; 267-8248

MICHIGAN

DETROIT PUBLIC LIBRARY

5201 Woodward Avenue
Detroit, MI 48202-4093
(313) 833-1440; 833-1409
FAX: (313) 833-5039

LIBRARY OF MICHIGAN

Govt. Documents Unit
P.O. Box 30007
Lansing, MI 48909
(517) 373-0640 FAX: (517) 373-3381

MINNESOTA

UNIV. OF MINNESOTA

Wilson Library
Govt. Publications Library
309 19th Avenue South
Minneapolis, MN 55455
(612) 624-5073 FAX: (612) 626-9353

MISSISSIPPI

UNIV. OF MISSISSIPPI

J.D. Williams Library
Federal Documents Dept.
106 Old Gym Bldg.
University, MS 38677
(601) 232-5857 FAX: (601) 232-5453

MISSOURI

UNIV. OF MISSOURI - COLUMBIA

Ellis Library
Govt. Documents
Columbia, MO 65201
(314) 882-6733 FAX: (314) 882-8044

MONTANA

UNIV. OF MONTANA

Maureen & Mike Mansfield Library
Documents Div.
Missoula, MT 59812-1195
(406) 243-6700 FAX: (406) 243-2060

NEBRASKA

UNIV. OF NEBRASKA - LINCOLN

D.L. Love Memorial Library
Documents Dept.
Lincoln, NE 68588
(402) 472-2562

NEVADA

UNIV. OF NEVADA

Reno Library
Govt. Publications Dept.
Reno, NV 89557
(702) 784-6579 FAX: (702) 784-1751

NEW JERSEY

NEWARK PUBLIC LIBRARY

U.S. Documents Div.
5 Washington Street -
P.O. Box 630
Newark, NJ 07101-0630
(201) 733-7812 FAX: (201) 733-5648

NEW MEXICO

UNIV. OF NEW MEXICO

General Library
Govt. Publications Dept.
Albuquerque, NM 87131-1466
(505) 277-5441 FAX: (505) 277-6019

NEW MEXICO STATE LIBRARY

325 Don Gaspar Avenue
Santa Fe, NM 87503
(505) 827-3826 FAX: (505) 827-3820

NEW YORK

NEW YORK STATE LIBRARY

Documents/Gift & Exchange Section
Federal Depository Program
Cultural Education Center
Albany, NY 12230
(518) 474-5563 FAX: (518) 474-5786

NORTH CAROLINA

UNIV. OF NORTH CAROLINA -

CHAPEL HILL
CB#3912, Davis Library
BA/SS Dept. - Documents
Chapel Hill, NC 27599
(919) 962-1151 FAX: (919) 962-0484

NORTH DAKOTA

NORTH DAKOTA STATE UNIV. LIBRARY

Documents Office
Fargo, ND 58105
(701) 237-8886 FAX: (701) 237-7138
In cooperation with Univ. of North
Dakota, Chester Fritz Library
Grand Forks

OHIO

STATE LIBRARY OF OHIO

Documents Dept.
65 South Front Street
Columbus, OH 43266
(614) 644-7051 FAX: (614) 752-9178

OKLAHOMA

OKLAHOMA DEPT. OF LIBRARIES

U.S. Govt. Information Div.
200 NE 18th Street
Oklahoma City, OK 73105-3298
(405) 521-2502, ext. 252, 253
FAX: (405) 525-7804

OKLAHOMA STATE UNIV.

Edmon Low Library
Documents Dept.
Stillwater, OK 74078
(405) 744-6546 FAX: (405) 744-5183

OREGON

PORTLAND STATE UNIV.

Millar Library
934 SW Harrison - P.O. Box 1151
Portland, OR 97207
(503) 725-3673 FAX: (503) 725-4527

PENNSYLVANIA

STATE LIBRARY OF PENN.

Govt. Publications Section
Walnut St. & Commonwealth Ave. -
P.O. Box 1601
Harrisburg, PA 17105
(717) 787-3752

SOUTH CAROLINA

CLEMSON UNIV.

Cooper Library
Public Documents Unit
Clemson, SC 29634-3001
(803) 656-5174 FAX: (803) 656-3025
In cooperation with Univ. of South
Carolina, Thomas Cooper Library,
Columbia

TENNESSEE

MEMPHIS STATE UNIV. LIBRARIES

Govt. Documents
Memphis, TN 38152
(901) 678-2586 FAX: (901) 678-2511

TEXAS

TEXAS STATE LIBRARY

United States Documents
P.O. Box 12927 - 1201 Brazos
Austin, TX 78711
(512) 463-5455 FAX: (512) 463-5436

TEXAS TECH. UNIV. LIBRARY

Documents Dept.
Lubbock, TX 79409
(806) 742-2268 FAX: (806) 742-1920

UTAH

UTAH STATE UNIV.

Merrill Library & Learning Resources
Center, UMC-3000
Documents Dept.
Logan, UT 84322-3000
(801) 750-2684 FAX: (801) 750-2677

VIRGINIA

UNIV. OF VIRGINIA

Alderman Library
Govt. Documents
Charlottesville, VA 22903-2498
(804) 924-3133 FAX: (804) 924-4337

WASHINGTON

WASHINGTON STATE LIBRARY

Document Section
MS AJ-11
Olympia, WA 98504-0111
(206) 753-4027 FAX: (206) 753-3546

WEST VIRGINIA

WEST VIRGINIA UNIV. LIBRARY

Govt. Documents Section
P.O. Box 6069
Morgantown, WV 26506
(304) 293-3640

WISCONSIN

ST. HIST. SOC. OF WISCONSIN LIBRARY

Govt. Publications Section
816 State Street
Madison, WI 53706
(608) 262-2781 FAX: (608) 262-4711
In cooperation with Univ. of Wisconsin-
Madison, Memorial Library

MILWAUKEE PUBLIC LIBRARY

Documents Div.
814 West Wisconsin Avenue
Milwaukee, WI 53233
(414) 278-2167 FAX: (414) 278-2137

National Aeronautics and
Space Administration
Code JTT
Washington, D.C.
20546-0001
Official Business
Penalty for Private Use, \$300

BULK RATE
POSTAGE & FEES PAID
NASA
Permit No. G-27



POSTMASTER: If Undeliverable (Section 158
Postal Manual) Do Not Return
